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On Oil Reserves

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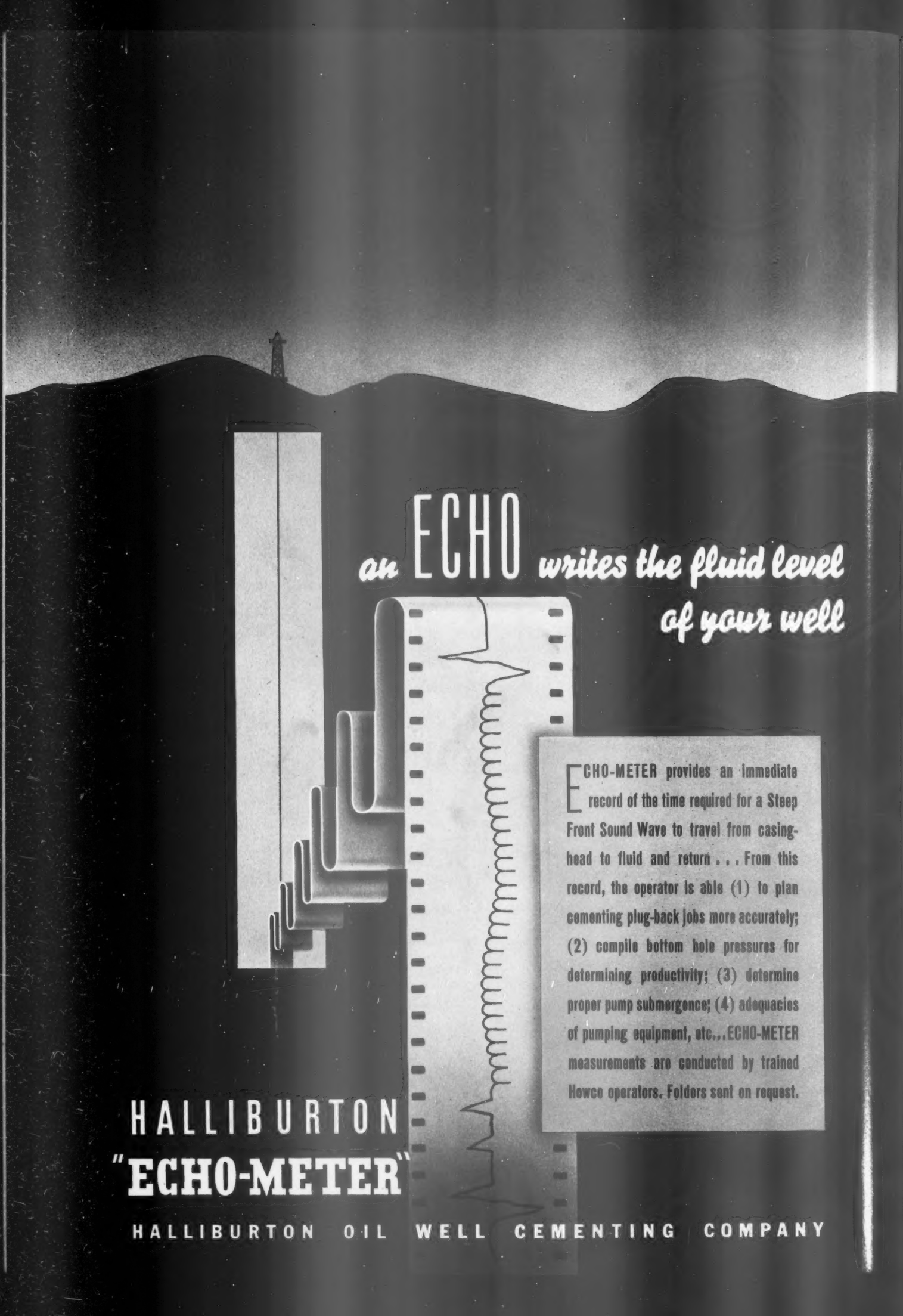
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Trends

Favorable Gasoline Stock Situation in Prospect by April 1

GASOLINE stocks at refineries and major terminals in the United States for the week ending January 18, dropped below the corresponding week of last year. This is the first time that such a comparison could be made since November 1938. A check by refining areas shows that gasoline inventories in general are approximately the same as last year, the small increases in one area being offset by decreases in another section. The only exception is the Indiana-Illinois group of refineries where gasoline stocks are substantially higher than they were a year ago.

CRUDE PRODUCTION *3,590,340 bbl. daily average — down 15,495 bbl. One year ago 3,641,308 bbl.*

CRUDE STOCKS *259,934,000 bbl. as of January 18—up 592,000 bbl. One year ago 237,571,000 bbl.*

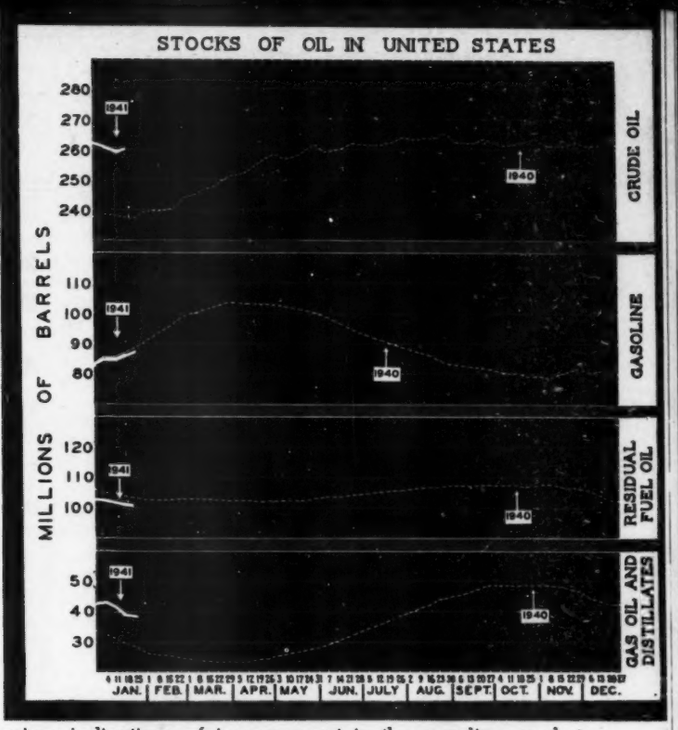
GASOLINE STOCKS *88,762,000 bbl. as of January 25—up 1,411,000 bbl. One year ago 89,405,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *100,297,000 bbl. as of January 25 — down 916,000 bbl. One year ago 103,238,000 bbl.*

GAS OIL AND DISTILLATES *39,039,000 bbl. as of January 25 — down 881,000 bbl. One year ago 27,866,000 bbl.*

REFINERY RUNS *3,625,000 bbl. daily week ended January 25—up 135,000 bbl. One year ago 3,470,000 bbl.*

With the domestic demand for gasoline running 6 or more per cent ahead of early 1940 and only a small decrease in exports, the industry has an excellent opportunity to further improve the statistical position of its principal product over the next few weeks. Assuming a continuance of refinery operations at present levels through February and March, gasoline stocks on April 1 would be more than 5 million barrels under the same date in 1940. This would mean that inventories at that time would not be far from the level which statisticians have said are necessary if the industry is to have the needed strong gasoline market over the balance of the year. There have been minor indications of improvement in the gasoline market since the first of the year but generally the product reflects a continuance of the excessive supplies which plagued the industry throughout 1940 and brought prices to the lowest levels in several years.

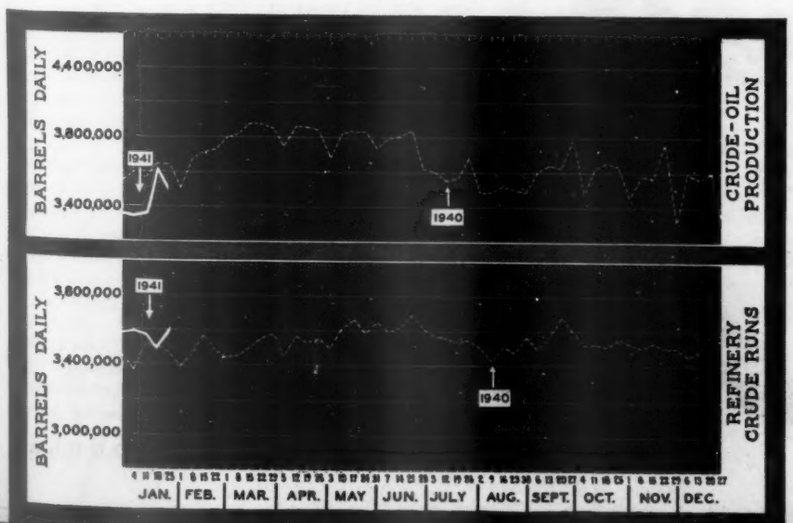


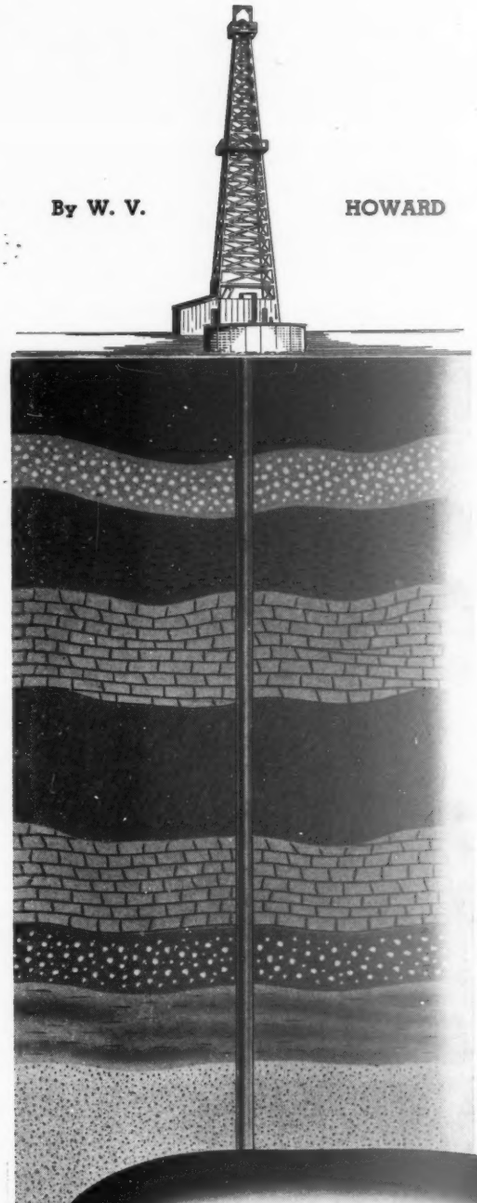
The principal price development in refined markets for the week was the reduction in distillate prices at East Coast prices including a 15-cent-per-barrel decline in diesel-fuel quotations. The explanation of this weakness is available from the current inventory data. Stocks of distillate and gas oil at East Coast refineries and large terminals are several million barrels or approximately 50 per cent higher than they were a year ago. Stocks of these products at Louisiana and Texas Gulf plants from which the supplementary supplies of the Atlantic seaboard come, are also substantially greater than they were a year ago.

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 25, 1941	Bur. Mines Jan. est. of demand	January state allowables	Jan. 18, 1941
Arkansas	70,005	66,100	70,666	69,965
California	605,250	594,800	571,000	622,150
Eastern fields	111,800	114,800	.....	111,500
Illinois	324,425	340,300	.....	323,200
Kansas	199,400	191,000	194,000	199,200
Louisiana	289,490	287,400	292,756	291,940
North Louisiana	*69,790*	.....	.....	*69,040*
Louisiana Gulf Coast	*219,700*	.....	.....	*222,900*
Michigan	40,290	46,100	.....	40,645
Mississippi	16,965	15,200	.....	16,935
Nebraska	2,625	2,000	.....	2,680
New Mexico	102,990	100,000	104,000	102,750
Oklahoma	392,000	439,000	390,000	388,500
Rocky Mountain states	97,200	96,800		95,170
Texas	1,337,900	1,297,500	1,370,000	1,341,200
East Texas	*376,925*	.....	.....	*375,100*
West Texas	*228,175*	.....	.....	*223,825*
North Central Texas	*139,400*	.....	.....	*138,450*
East Central Texas	*83,075*	.....	.....	*84,275*
Texas Panhandle	*72,475*	.....	.....	*72,025*
Texas Gulf Coast	*355,200*	.....	.....	*357,075*
Southwest Texas	*91,650*	.....	.....	*90,450*
Total United States	3,590,340	3,591,000		3,605,835
Production January 1-January 25, 1941			86,855,620 bbl.	
Same period last year			90,977,010 bbl.	

The bright spot in the week's price developments was the 15-cent-per-barrel advance in posted schedules for Pennsylvania Grade crude oil effective Monday, January 27. This is the third 15-cent advance in these schedules in less than 3 months, the first increase being effective November 12 of last year. The increase is additional evidence of the improved statistical position of the Pennsylvania Grade industry applying to both crude oil and the lubricating-oil products of refineries. Last year the Bradford Grade crude dropped from a high of $2.75 at the start of the year to a low of $1.85 on August 28 with similar reductions in other grades.





Proven Reserves

20,099,258,000 Barrels

By W. V. HOWARD

Proven oil reserves of the United States as of January 1, 1941, totaled 20,099,258,000 bbl. This is an increase of 411,919,000 bbl. during the year, after deducting 1940 production of 1,338,237,000 bbl.

Of the 1,750,156,000-bbl. new reserve discovered in 1940, Texas had 932,062,000 bbl., or 53.3 per cent; California, 278,749,000 bbl., or 15.9 per cent; and Louisiana, 147,005,000 bbl., or 8.4 per cent.

In reserves, Texas leads with 55.9 per cent of the national total, or 11,238,639,000 bbl.; California is second with 17.4 per cent, or 3,508,357,000 bbl.; and Oklahoma is third, with 1,183,629 bbl., or 5.9 per cent.

Tables showing discoveries and new reserves are on Pages 61 to 64.

ESTIMATED proven oil reserves of the United States as of January 1, 1941, totaled 20,099,258,000 bbl., representing an increase of 411,919,000 bbl. for the past year.

Changes in reserve figures fall under three three categories, namely, discoveries of new fields or new sands in old fields, extensions of previously known sands and revisions in earlier estimates. Of the 1,749,159 bbl. added to the recoverable supply in 1940, over half, or 967,374,000 bbl., was in extensions: approximately one-quarter, or 432,693,000 bbl., was accounted for by revisions of earlier estimates, and the balance, 350,078,000 bbl., was oil found in new sands or new areas.

Some of the discoveries are of far greater importance than present estimates of their recoverable reserve would indicate. In California, the single discovery in the Del Valle area accounts for only 10,000,000 bbl. proven reserve, which is small for California fields. However, it opens up a new area for development in a region where shallow drilling is possible. Operators who are prevented from prospecting in the San Joaquin or Los Angeles basins because of high costs are already stimulated to enter this area of shallower sands and the Del Valle field is believed to be the forerunner of a number of similar discoveries.

In the Permian basin two developments are significant. Deep production has been picked up in lower Permian lime, and in both the Simpson and Ellenburger in fields remote from those in which this production has formerly been obtained. This greatly increases the ultimate possibilities of this district in which many operators had come to believe that the only reservoirs were in the Big lime and in flanking sands. In New Mexico, the discoveries flank the high known to extend from Artesia to Vacuum. The presence of this flanking production, indicated by discoveries in 1939 and confirmed this year, affords encouragement to spread farther afield in areas flanking other highs in the Permian basin.

In the North Central Texas district there are discoveries of deep sands which are of prime importance in prolonging the productive life of that region, new shallow fields have been found in the middle of old producing areas and the known sands have been found productive outside previously drilled regions. This, of course, stimulates further activity. The Woodbine discovery at Hawkins has started a search for more deposits of the same type in an area which had practically been forgotten, so far as prospecting is concerned.

In the coastal areas, the most significant feature of 1940's discoveries were the extension of the Frio and Wilcox trend plays and the fact that deep drilling on the flank of salt domes in Louisiana has convinced operators that so long as a known reservoir remains undrilled, every dome is a potential producer.

In the northern Mid-Continent, discoveries are more within closely drilled areas than out in wildcat territory. However, extension of the present limits of production is clearly indicated by outposts in Kansas, including some which were not definitely tested by the end of the year but which were showing production.

Illinois' and Michigan's discoveries were of less significance than those west of the river. Both were of the nature of shock absorbers to the production decline that is now taking place. In Illinois, most of the discoveries were along the flanks of the La Salle anticline and were similar in nature to the old fields on the structure itself. More sands are represented but the supplies found are hardly of lasting importance.

More because of greater conservatism in estimating proven areas than for any other cause, estimated proven reserves resulting from discoveries is only 72 per cent of those discovered in 1939. The number of discoveries runs 20 per cent higher and on the same basis, but oil discoveries should be proportionately greater.

Extensions and Revisions

The amount of oil found in extensions to known pools is less than half as great as in 1939. The greater part of this oil comes from California and West Texas, from extensions to Coalinga and Slaughter. Probably the main reason for this

decline is the fact that so much undrilled territory was found in 1939 that operators were compelled to drill inside locations rather than step out in outpost locations. This was true in such fields as Wasson, Tupman, K.M.A., Hull-Silk, Salem, Centralia, Louden, Lance Creek and many others. The current year should see more activity around the edges of fields, although such areas as Wade City, Orange Grove, Coalinga extensions, and many others are still largely undrilled.

Revisions of estimates previously made result from three main considerations. A discovery is allocated production largely on the basis of comparison with other fields producing from the same horizon. As time goes on, evidence accumulates that this estimate was erroneous, to some extent at least. The estimated recovery must then be reestimated. Estimated reserves in newly discovered areas are thus the best procurable but subject to modification and the appraiser who carries the same figures year after year is more apt to mislead than to present a correct picture. In 1940, it was definitely apparent that estimates previously made on Kettleman Hills were high by about 200,000,000 bbl. At the same time, estimates carried on East Texas have been maintained for years below those generally recognized, and have accordingly been raised 400,000,000 bbl.

A second basis for modifying estimates of reserves is the slow growth of fields beyond the limits originally set in the estimate. These additions are often made one location at a time and are not placed in the category of extensions for the simple reason that there might be as many as 1,000 such "extensions" in a single year. Periodically, however, the estimated reserves of fields are found to be increased by reason of this slow expansion of the limits. This, of course, is partially compensated for by failure of wells drilled in what was considered to be the originally proven area. Normally, this give and take results in small individual corrections which may have a large cumulative effect.

The third type of revision is that which takes place when a field is settled and decline curves can be constructed. Here the estimate ceases to be volumetric or comparative and becomes established by the actual record of the field itself. The trend of improved production methods resulting in greater yields causes the estimates of old fields to be raised from time to time. This year's upward revision of 432,693,000 bbl. is made up of a large number of both positive and negative revisions and is believed to be conservative.

The number of years' supply represented by currently estimated proven reserves is reduced from 15.7 to 15 years. Past records have indicated that 12.5 years' supply is about the maximum for price stability. Any drop in years' supply to that figure indicates a decreasing danger of overproduction. Any decline below that figure indicates actual shortage. Today, the oil industry is still well above the level of possible shortage of immediately available reserves by about 2.5 years' supply or 3,350,000,000 bbl. This is nearly double last year's total additions to reserves before deduction of oil produced. If production remains steady, our present reserves are sufficiently great to permit 2.5 years' production without any new discoveries before there would be any real fear of shortage.

As California's production has remained practically unchanged, its situation with regard to years' supply has improved, particularly in the Los Angeles Basin. Lack of discoveries in the Rocky Mountain States is responsible for a decline in years' supply which is augmented by increasing production. Wyoming, in particular, is now deficient in reserves and prospecting will probably increase in 1941. The position of Texas remains strong, with proration effective in maintaining important reserves and in preventing chaos in the industry by keeping production within market demands.

Increased production in the Louisiana-Arkansas-East Texas region has more than overcome the added reserves and additional oil is necessary to bring this region up to a normal parity of about 12.5 years' supply. Both Oklahoma and Kansas have also a reduced supply in terms of current demand, the former state because of lack of discoveries and the latter because of increased production, which may increase still further this year, given continued decline in Illinois.

East of the Mississippi, conditions are not good with both Illinois and Michigan depleting their reserves at a rate much faster than discoveries warrant.

(Continued on Page 61)

Proven Oil Reserves on January 1, 1941

State and district—	Estimated reserves as of Jan. 1, 1940	Revision of previous estimate	1940 Discoveries	1940 Extensions	Total	Less 1940 production	Estimated reserves as of Jan. 1, 1941	Gain or loss (—)	Years' supply Jan. 1, 1941	Years' supply Jan. 1, 1940	Per cent Jan. 1, 1941
California	3,447,622,000	—54,751,000	10,000,000	323,500,000	3,726,371,000	224,014,000	3,502,357,000	54,735,000	15.6	15.4	17.4
Southern	899,849,000	154,200,000	.....	52,500,000	1,106,549,000	108,050,000	998,499,999	98,650,000	9.2	7.9	5.0
Coastal	465,853,000	5,040,000	10,000,000	15,000,000	495,893,000	28,642,000	467,251,000	1,398,000	16.3	17.7	2.3
Northern	2,081,920,000	—213,991,000	.....	256,000,000	2,123,929,999	87,322,000	2,036,607,000	—45,313,000	23.3	24.9	10.1
Montana	88,198,000	.....	.....	.....	88,198,000	6,571,000	81,617,000	—6,581,000	12.4	15.1	0.4
Wyoming	278,061,000	.....	10,120,000	6,600,000	294,781,000	26,132,000	268,649,000	—9,412,000	10.2	13.1	1.4
Colorado	21,765,000	.....	.....	2,400,000	24,165,000	1,401,000	22,764,000	999,000	16.2	15.5	0.1
Utah	18,000	.....	.....	.....	18,000	2,000	16,000	—2,000	8.0	9.0	0.0
New Mexico	703,915,000	.....	2,240,000	32,700,000	738,855,000	38,757,000	700,098,000	—3,817,000	18.1	18.7	3.5
Texas	10,794,015,000	344,743,000	135,179,000	452,140,000	11,726,077,000	487,638,000	11,238,439,000	444,424,000	23.0	22.2	55.9
Panhandle	723,622,000	.....	.....	.....	723,622,000	26,110,000	697,512,000	—26,110,000	26.7	29.5	3.5
West	2,464,613,000	66,417,000	22,934,000	341,480,000	2,762,610,000	83,272,000	2,679,338,000	214,725,000	32.2	31.1	13.3
North	622,066,000	.....	36,310,000	101,130,000	759,506,000	38,770,000	720,736,000	98,670,000	18.6	19.6	3.6
West Central	139,896,000	3,970,000	7,930,000	3,070,000	154,866,000	10,434,000	144,432,000	4,536,000	13.8	13.9	0.7
East	2,891,183,000	400,000,000	18,520,000	3,900,000	3,313,603,000	167,059,000	3,146,544,000	255,361,000	18.8	16.1	15.7
South	232,849,000	79,610,000	4,620,000	.....	317,079,000	27,356,008	289,723,000	56,874,000	10.6	8.8	1.4
South Central	54,698,000	14,893,000	100,000	.....	69,691,000	7,717,000	61,974,000	7,276,000	8.0	6.5	0.3
Lower Gulf	867,017,000	—29,340,000	22,655,000	210,000	860,542,000	44,014,000	816,528,000	—50,489,000	18.6	19.0	4.1
Upper Gulf	2,798,071,000	—57,973,000	22,110,000	2,350,000	2,764,558,000	82,906,000	2,681,652,000	—116,419,000	32.3	37.7	13.3
Louisiana	882,493,000	71,220,000	75,685,000	100,000	1,029,498,000	103,523,000	925,975,000	43,482,000	8.9	9.4	4.6
Gulf Coast	711,070,000	57,700,000	53,885,000	100,000	822,755,000	79,020,000	743,735,000	32,685,000	9.4	10.3	3.7
North	171,423,000	13,520,000	21,800,000	.....	206,743,000	24,503,000	182,240,000	10,817,000	7.4	6.8	0.9
Arkansas	310,156,000	15,752,000	6,000,000	23,614,000	355,522,000	25,871,000	329,651,000	19,495,000	12.7	14.5	1.6
Mississippi	2,297,000	.....	400,000	46,000,000	48,697,000	4,282,000	44,415,000	42,118,000	10.4	7.4	0.2
Oklahoma	1,287,906,000	.....	33,000,000	12,320,000	133,322,600	149,597,000	1,183,629,000	—104,277,000	7.9	8.4	5.9
Kansas	733,742,000	24,724,008	54,320,000	.....	812,786,000	64,945,000	747,841,000	14,099,000	11.3	12.4	3.7
Nebraska	49,000	.....	100,000	3,000,000	3,149,000	288,000	2,861,000	2,812,000	9.9	4.0	0.0
Illinois	617,528,000	7,511,000	20,090,000	50,000,000	695,129,000	146,451,000	548,678,000	—68,850,000	3.7	6.7	2.7
Indiana	20,944,000	.....	.....	15,000,000	35,944,000	4,992,000	30,952,000	10,008,000	6.2	14.6	0.2
Kentucky	55,998,000	.....	250,000	.....	56,248,000	5,364,000	50,884,000	—5,114,000	9.5	10.0	0.3
Tennessee	450,000	.....	.....	.....	450,000	46,000	404,000	—46,000	8.8	9.0	0.0
Michigan	58,365,000	23,494,000	2,705,000	.....	84,564,000	19,748,000	64,816,000	6,451,000	3.3	2.5	0.3
Ohio	40,335,000	.....	.....	.....	40,335,000	3,116,000	37,219,000	—3,116,000	11.9	12.7	0.2
West Virginia	41,461,000	.....	.....	.....	41,461,000	3,426,000	38,035,000	—3,426,000	11.1	11.7	0.2
Pennsylvania	250,376,000	.....	.....	.....	250,376,000	18,603,000	231,773,000	—18,603,000	12.5	14.4	1.1
New York	51,645,000	.....	.....	.....	51,645,000	3,460,000	48,185,000	—3,460,000	14.0	10.1	0.2
Total United States	19,687,339,000	432,693,000	350,089,000	967,374,000	21,437,495,000	1,338,237,000	20,099,258,000	411,919,000	15.0	15.7	

Secretary Ickes Reaffirms Stand For Federal Regulation

By HAROLD L. ICKES
Secretary of the Interior

In this article, written exclusively for the Annual Number of The Oil and Gas Journal, Mr. Ickes reiterates his opinion that some form of centralized control of the oil industry is essential for the avoidance of waste, though he denies that he is seeking to become "oil dictator." In other pages of this issue, several representative leaders in the industry speak out strongly against the need of centralized control.

NATIONAL defense has become the outstanding concern of the United States, and the oil industry along with other industries has been taking stock of its current ability to meet defense needs. In doing this it has turned back to the record of 1914 to 1918 for precedents and has found that while it then played a significant role, especially in the supply of fuel oil, it has in the intervening years become the dominant energy factor in virtually all phases of the nation's transportation.

Regional isolation or national integration are conditions strongly influenced, if not controlled, by transportation. Motor vehicles, airplanes and ships, all wholly or largely energized by petroleum products, have created the pattern of our present-day industrial, community and national life. Each city and each state, as well as the federal Government, has a problem in automotive traffic. During the past 20 years the highways with automobile traffic have become a major factor in community, state and national integration. Airlines have brought all parts of the country within a few hours of each other. Oil-burning boats on our lakes and rivers, along our coasts and across the oceans are handling vast quantities of the goods that contribute to the American standard of living.

Twenty years ago workers lived near the factory and walked or traveled to work on street cars or trains; as a result, factories were clustered in or near the city. Today, workmen go to their jobs by private automobiles and buses; indeed, many of the factories built on "new ground" are entirely dependent upon automobiles for workers and materials because the extent of an industrial community now is limited only by its accessibility to motor vehicles.

The same is true of those who work in offices and stores. Our homes used to parallel the street-car lines; now they stretch to the outlying hills and valleys, places within reach of the automobile but not of the street car. So dependent have we become upon the privately owned automobile for transportation between our homes and places of work that we could not carry on if we had to depend upon public-utility transportation alone. That situation must be recognized by those who assume that gasoline deficiencies in an emergency could be met by the curtailment of civilian consumption.

Petroleum products have not only changed the cities and factories; they have also changed our rural life. Of an estimated 30 million automobiles in use, about 12 million are on farms or in towns of less than 2,500 population. Nearly 2 million tractors are on our farms and virtually the entire movement of produce from the ranches, farms and forests is dependent upon the energy of petroleum products. During the past 20 years the oil industry has been required to do more than quadruple its production of crude-oil and refining capacity. Few people may realize that, in about 100 days of peace, we now consume as much oil as we did in the entire war year of 1918.

Extensive Technologic Advances

During the past 20 years the technologic changes in the oil industry have been extensive. Engineering knowledge of what can and should be done in producing oil and gas has completely changed and, with that change, problems in economics and the relationships between the industry and the state and federal governments have developed.

A review of the recorded thought of oil men at the close of the World War indicates that producers then were of the opinion that to restrict the flow of an oil well was to destroy it. Some years later it was learned that failure to use the reservoir energy properly results in leaving much oil in the oil sand that could be obtained by primary methods. The effective use of reservoir energy has almost always necessitated the maintaining of back pressure; that is, the controlling of production below potential. In this simple fact, taken in connection with divided surface ownership and the so-called rule of capture, rests much of the problem of the relationship between the industry and the governments, state and federal.

Every business man is concerned about his fair share of whatever there is to be shared. The first approach to the problem of equitable distribution of oil production was developed in several states. All states have not seen fit to pass laws to curtail the initiative of the individual for the common good. In states that have laws there is a lack of uniformity, not only in the laws but in their administration. This lack of uniformity in administration as between states and as between wells and fields within a state is one of the major problems which cries for solution.

Plenty Begets Prodigality

It should be axiomatic that, to avoid the possibility of future want of a material that supplies about 60 per cent of the transportation power of the country, waste should be reduced to the lowest possible level. In order to produce oil at high levels of efficiency, large reserves are necessary, but large reserves or potentials make some producers want to produce inefficiently. The maintenance of large reserves also calls for continuous exploration and development. To keep pace with demand, the oil industry must continue each year to find or develop twice as much oil as is produced.

The fact that there always are those who insist on the right to do what they want, in spite of the effect upon the neighbor or the social structure, has necessitated laws setting up standards for individual performance. It would appear to be logical that standards of petroleum production sufficiently flexible to adjust for the physical differences as between oil fields and oil wells should be just as desirable in one place as in another. That is the idea that I had in mind in supporting the oil-conservation bill that was before the Seventy-sixth Congress.

I believe that some form of central coordination for the prevention of avoidable physical waste is necessary. Although I have been accused of wanting to be the "commissar," the "czar," the "dictator" of the petroleum industry I state positively that that is all inspired nonsense. Even if it were assured that I could be made the umpire for the oil industry, the knowledge that I have gained and the experience that I have had would make me extremely cautious before rubbing any magic lamp. I want to repeat what I said concerning H.R. 7372 before the Cole committee, "that if the committee and the Congress can find a better way of conserving oil and gas than is proposed in this bill, why, I would like to join in support of any such bill as that."

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The fact that the federal Government, the oil-producing states and the oil industry are not cooperating toward the effective production and utilization of this vital integrating but exhaustible natural resource, petroleum, should be a challenge to all public-spirited citizens. Both as a citizen and as a public official I am sincerely interested in the welfare of the petroleum industry of the United States and I shall continue to seek a method by which its reasonable coordination can be effected.

T.N.E.C. Publishing Reports And Recommendations

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 28.—A series of reports on what is wrong with the oil industry and recommendations on what should be done about it can be expected when the Temporary National Economic Committee completes the printing of its 5-ft. shelf of material on the concentration of economic power.

Most spectacular, probably, will be the report of the Department of Justice which, according to all indications, will justify the department's current policy and pending antitrust suit to divorce the various branches of the oil industry from each other and disintegrate the industry into small independent units.

The first official admission that such a report would be published was made recently when the T.N.E.C. held an open meeting to discuss plans for winding up its existence by April 3. Dr. Dewey Anderson, executive secretary of the T.N.E.C., submitted a progress report listing the 43 monographs now in process of publication, and it was discovered that the new list differs somewhat from the list of titles made last November.

One of the two or three new titles on the list is, "Control of the Petroleum Industry by Major Oil Companies," by Roy C. Cook, Department of Justice. Mr. Cook is a combined attorney, economist, and accountant on the staff of Asst. Atty. Gen. Thurman Arnold. He sat through all of the T.N.E.C. oil hearings, although taking no public part in them. His report, which is now in the process of being printed, was written in conjunction with the other Department of Justice men who sat in on the oil hearings—Hugh B. Cox, W. B. Watson Snyder, Christopher Del Sesto, F. E. Berquist, and Leo Finn. While nothing can be learned of the contents of this report, its general character can be inferred from the fact that several of these men took a prominent part in drafting the pending disintegration suit. When published as a monograph it will carry a notation that it represents the opinions of the authors only and not the T.N.E.C. itself.

Defense of Status Quo

Another monograph on the oil hearings has been prepared by the Department of Commerce, but there is some question as to how this may be published, and it may never become a part of the T.N.E.C. records. This report was written by Sumner T. Pike, formerly assistant secretary of commerce, and now a member of the Securities and Exchange Commission. He attended the T.N.E.C. oil hearings along with Clarence Avildsen and Robert McConnell of the Department of Commerce. This report, which was completed some time ago, is reported to be somewhat a defense of the status quo in the oil industry and to reflect the attitude of the major companies, and therefore there is a suspicion that certain pressure may be brought to bear to prevent its publication.

In addition to the 43 monographs there will be a forty-fourth volume, possibly published in sections, which will be the staff report. The manuscript is virtually completed and most of the more than 40 chapters have been reviewed by various T.N.E.C. attaches and interested government officials. These chapters are described as factual in character and to a considerable extent they will summarize the hearings, but will also contain recommendations and conclusions of the staff, though these conclusions may not be adopted by the T.N.E.C.

The summary volume will be divided into three sections dealing with industrial problems raised by concentration of economic power, investment problems raised by concentration of economic power, and methods of dealing with economic power. In the first section is a subdivision dealing with concentrated control over natural resources, and this includes chapters on oil and the other extractive industries. Authorship of these chapters has not been revealed, but they were prepared under the direction of Dr. Theodore Kreps of Stanford University, T.N.E.C. economic consultant. The fact that the oil chapter is grouped with other resource-industry studies under the heading of concentration of economic power gives a clue to the approach and treatment of this part of the staff report.

Finally, the T.N.E.C. itself will have a report, which may differ in many respects from the conclusions of the staff and of the authors of the various monographs.

Considerations of national defense may prevent Congress from paying much immediate attention to this voluminous T.N.E.C. material, but it is all being published as an official record and the many volumes of hearings and reports are going to several hundred libraries and research organizations and will become material for legislative proposals for many years. This was suggested by Chairman O'Mahoney at last week's meeting, when he said:

"Defending Democracy"

"Our national attention is now so concentrated upon the task of defending the opportunity of democracy to survive that we shall probably have but little time to devote to suggestions for reorganization of the democratic system. When the great national-defense effort has been accomplished, there will still remain the imperative necessity of defining the democratic code under which individual liberty may be made secure in a world which requires great collective effort for the utilization of the inventions and discoveries of modern science."

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Six Big Buyers Adopt New Purchase Policies

SIX of the largest crude-oil buyers in the Mid-Continent have declared new purchase policies based on 100 per cent of tank tables in Oklahoma and Kansas effective February 1.

Joining in abandonment of the previous 98 per cent purchase policy are the Texas Co., which made the original announcement, Standard Oil Co. (Indiana), Gulf Oil Corp., Phillips Petroleum Co., Carter Oil Co. and Magnolia Petroleum Co.

Uniformity of new policies terminates with full deduction for impurities and provision for correction of volume to a base temperature of 60° F. There appeared to be two policies developing at the start of this week regarding the mechanics of making volume corrections for temperature. The Texas Co. announced that it would deduct or add 1 per cent for each 25° of temperature above or below 60° F.

Phillips Petroleum Co.'s new policy effective at 7 a. m., February 1, provides for full deduction for all basic sediment and water and for computation of volume corrected for temperature, allowing or deducting 1/25 of 1 per cent for each degree of temperature below or above 60° F. The Phillips policy applies to Oklahoma, Kansas and Arkansas.

Some purchasers are reluctant to embrace the 100 per cent tank-table policy because pipe-line companies will continue to make an automatic and flat deduction of 1 per cent to cover losses and evaporation in storage and transit. Theoretically, the pipe-line deduction places the purchaser in the position of paying for 100 bbl. of oil in the field and receiving payment for only 99 bbl. at the point of sale. Contention is made by some that pipe-line companies should base their rates upon a scale that will automatically cover actual losses in handling.

The gravity scale of crude-oil prices for Oklahoma and Kansas remains unchanged at a range of 60 cents to $1.10 per barrel.

Investigation indicates that producers will receive approximately 2.5 per cent more for their crude under the 100 per cent tank-table policy from February 1 forward. About ½ of 1 per cent of the theoretical increase over the previous use of 97 per cent tank tables will be absorbed in the volume corrections for temperature and full deduction for basic sediment and water. Under 97 per cent tank tables Mid-Continent purchasing companies have tolerated up to 1 per cent of basic sediment without volume corrections.

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Companies Answer Charges Of Price Discrimination

WASHINGTON, D. C., Jan. 28.—The four oil companies charged with price discriminations in the Detroit, Mich., area, allegedly violating the Robinson-Patman Act, last week answered Federal Trade Commission complaints. Respondents admitted selling gasoline at lower prices to certain outlets, but denied that these sales constituted violations of the act.

The answers were filed by the Texas Co., Shell Oil Co., Inc., Standard Oil Co. of Indiana, and Gulf Refining Co.

All four statements maintained that the lower prices were justified by differences in the cost of sale and delivery arising through different methods or amounts in which the gasoline was sold and delivered. In addition, the companies asserted, the price differentials were made in good faith to meet equally low prices by competitors.

Shell admitted selling gasoline at 1 to 1½ cents per gallon lower to Henry Starkey Hickey, trading as the Grand River Oil & Gas Co., but claimed it was not aware that Mr. Hickey resold the gas in competition with retailers who bought from Shell.

Standard acknowledged its prices to four dealers ranged from ½ to 1¾ cents per gallon below its regular prices, but insisted the four customers were wholesalers and entitled to a lower price than retailers. The four are: Citrin-Kolb Oil Co., Stikeman Oil Co., Wayne Oil Co., and Ned's Auto Supply Co.

The Gulf and Texas companies conceded selling gasoline to the Firestone and Goodrich Rubber companies at, respectively, 1 to 2 cents and ½ to 2 cents per gallon lower than ordinary prices, but denied that these decreased prices were in effect after June 1936.

STATE CAPITALS...

CALIFORNIA

THE CONSERVATION COMMITTEE of California Oil Producers recommended a daily California oil production of not more than 571,000 bbl. for February at its meeting last week. The greater part of the necessary curtailment of production to make room for newly completed wells was accomplished through a reduction in the depth allotment, spread over all the wells in the state, except for those less than 1,900 ft. deep. This reduction will account for 4,121 bbl. per day, while a 1-bbl. reduction in the maximum allowable for any one well, down to 147 bbl. per day, will apply to 963 wells and will therefore result in curtailment of 963 bbl. per day, making a total reduction of 5,084 bbl. per day.

New and recompleted wells will require allotments of 10,581 bbl. per day, arrived at by the reduction noted above and by declines of old producing wells added to the state allotment, bringing it to 571,402 bbl., well within the quota of 571,500 bbl. per day. It was explained at the meeting that the change in the minimum depth allotment would not affect shallow wells of the so-called "stripper" class, nor would it affect marginal producers in the deeper areas except to a very slight degree.

INDIANA

THE INDIANA OIL AND GAS PRODUCERS Association is seeking to add Indiana to the list of states that now have conservation laws controlling the production of oil. A comprehensive oil conservation bill, modeled after the Michigan law, has been introduced in the Indiana House of Representatives under the sponsorship of the association's legislative committee. Sponsors of the bill admit that it will be a battle to get it enacted but they believe they have a better than a "50-50" chance.

The bill provides for practically the same set-up as is now in effect in other oil-producing states with oil conservation laws. It gives the Indiana Conservation Department the right, after hearings, to regulate drilling, operation and production of oil in the state.

The bill provides, however, that if the Conservation Department decides upon proration it shall give a well producing from an average depth of 1,000 ft. or less a base allowable production of at least 100 bbl. of oil per week and that for a well producing from an average depth greater than 1,000 ft. the base allowable production shall be increased 10 bbl. per well, per week, for each 100 ft. depth greater than 1,000 feet.

Penalty for violation is $1,000 a day for each and every day of such violation. Appeals from the orders of the Conservation Department may be taken, under the bill, to court. The bill also provides for a tax of ¼ cent per bbl. of crude oil to provide funds for carrying out the provisions of the act.

While Indiana is producing only a fraction of the amount of oil produced in its neighboring state of Illinois, its production is rising. Indiana's production in 1940 was over 5,000,000 bbl., practically tripling the 1939 production of 1,759,000 bbl.

One of the chief reasons for optimism among the Indiana oil men over passage of the bill is that it has the backing of some of the leading Republican legislators—the Republicans have control of both the House of Representatives and the Senate. Rep. Timothy O'Connor (R. Frankfort), chairman of the House committee on natural resources, introduced the bill. Mr. O'Connor, who tried unsuccessfully to get a similar measure through the 1939 Indiana legislature when the House was controlled by Republicans and the Senate by Democrats, said he believed that this measure had "a much better chance."

Silent approval of the measure is also expected from the Democratic governor, Henry F. Schricker. Governor Schricker, who took office January 13, has refrained from commenting on Republican-sponsored legislation but he has gone on record repeatedly as favoring conservation of natural resources. He devoted a major portion of his inaugural address to the subject. The bill also has the approval of the state Conservation Department which Governor Schricker yet controls. The Republicans are sponsoring legislation, almost certain of passage, which will place control of the department unler a board dominated by Republican-elected state officials.

Chief opposition to the measure is coming from southern Indiana Democratic legislators who fought the measure successfully 2 years ago but who are in the minority now. They say that their businessmen constituents tell them that enactment of the bill will drive oil men out of Indiana.

TEXAS

A 60-DAY STATE-WIDE PRORATION ORDER was issued by the Railroad Commission on Saturday, the order for February and March setting allowable production at 1,318,873 bbl., or 7,106 bbl. over the current allowable. The order, signed by all three members of the commission, was estimated by Oil and Gas Division engineers to place Texas' production about 40,000 bbl. under the Bureau of Mines recommended level (1,312,900 bbl.) when taking into consideration an estimated 3.5 per cent underproduction of allowables. Exempting a large number of fields, the order called for 9 shutdown days in February and 10 in March, as compared with 10 in January. In the Panhandle district, the order required closures on only 6 days in February and 7 in March.

Basic allowables of the various districts, in barrels, as of December 1, 1940 and February 1 are as follows:

District	Dec. 1	Feb.1
Southwest Texas	295,303	295,816
Gulf Coast	307,252	316,662
East Central	90,868	82,133
East Texas	520,851	520,851
West Central	58,454	59,215
West Texas	268,864	289,538
North Texas	130,638	140,681
Panhandle	82,496	86,424
Total	1,754,726	1,791,320

State-wide shutdown days were set as February 1, 2, 8, 9, 15, 16, 22, 23 and 28 and March 2, 8, 9, 15, 16, 22, 23, 29, 30 and 31. Panhandle shutdowns were ordered on February 2, 9, 15, 16, 23 and 28 and March 2, 9, 15, 16, 23, 30 and 31.

Fields exempt from shutdown days included: In West Texas, Johnson, Big Lake, Grayson, World, Hendrick, Howard-Glasscock, Iatan-East Howard, Snyder and Taylor-Link; in in East Central, Mexia, Powell, Richland, Sulphur Bluff, Wortham, Boggy Creek, Cayuga, Grapeland, Lone Star, Rodessa and Talco; in Southwest Texas, Luling-Branyon, Mission River, Oakville, Salt Flat, Plummer, Charamousca, Eagle Hill, Minnie Bock, Moca, Samfordyce, North Samfordyce and Seven Sisters; in Gulf Coast, Angleton, Arriola, Bammel, Barbers Hill, New Batson, West Beaumont, Boling, Buckeye, Clay Creek, Damon Mound, Danbury Dome, Esperson Dome, Eureka Heights, Goose Creek, High Island, New and Old Hull, Humble, Kubela, Livingston, Lochridge, Louise, Mykawa, New Mykawa, North Dayton, West Orange, Sandy Point, West Columbia and New West Columbia.

TEXAS' ALLOWABLE OIL PRODUCTION on Saturday was estimated by the Railroad Commission to average 1,311,767 bbl. daily, or 31,645 bbl. under the January Bureau of Mines recommended figure after taking into consideration an estimated 3.5 per cent underproduction of allowables. On Saturday the basic allowable had risen to 1,791,143 bbl. daily, but allowing for 10 shutdown days and a daily exemption of 98,412 bbl., the net daily allowable totaled 1,311,767 bbl. This figure is 14,267 bbl. above the bureau estimate, but a 3.5 per cent forecast underproduction of 45,912 bbl. would result in holding production 31,345 bbl. under the bureau's figure.

Daily exemptions gained only 47 bbl.

North Texas allowables rose 704 bbl. daily for the largest district gain, to 113,600 bbl.

East Texas production remained close to last week's figure, gaining only 81 bbl., at 355,069 bbl. daily. Southwest Texas production at 212,418 bbl., marked a daily gain of 453 bbl. over the preceding week. The Gulf Coast area had permissives Saturday averaging 234,309 bbl. daily, a gain of 289 bbl.

Other allowables were: East Central Texas, 83,792 bbl., up 255 bbl.; West Central Texas, 48,811, down 80 bbl.; West Texas, 202,182, up 544 bbl., and Panhandle 61,586, up 127 bbl.

THE RAILROAD COMMISSION has issued field rules for the Hawkins pool of Wood County, Eastern Texas, the order being effective January 24 and calling for proration based 50 per cent on acreage and 50 per cent per well. Ordering 20-acre spacing with 10-acre tolerance, the rule calls for a distance of at least 933 ft. between wells, and no well to be drilled closer than 466 ft. from property lines.

Based on the January 20 hearing held at Hawkins the order stipulated that surface casing be set to 1,600 ft., which will reach into the Midway, the oil string being placed below the oil and gas contact and cemented 1,200 ft. above the shoe.

ARKANSAS

TWO IMPORTANT PROPOSALS by operators will be the subjects for discussion before the Arkansas Oil and Gas Commission at its state-wide hearing called for February 4 in El Dorado. Producers of 160 of a total of 166 wells in the Jones sand horizon of the Schuler field, Union County have applied to the commission for an order approving an agreement for the unit operation of a portion of the Jones sand horizon and the construction and operation of a repressuring plant to repressure the sand. An order is also asked establishing a formula with respect to the allowable production of wells producing from the Jones sand either within or without the unitized area.

Several months of planning by Schuler operators culminated recently in the agreement including all but one Jones sand producer. The project will provide for construction of a large pressure-maintenance plant in the field.

The possibility for a second repressuring or pressure-maintenance project is seen in the action of the commission in issuing notice of hearing on field rules for the McKamie field. McKamie is considered a gas-condensate pool. An active water drive is expected to obviate the necessity for recycling of gas to the Smackover lime horizon, but plans call for introducing the gas to the Tokio sand at about 2850 ft. Wider well spacing is believed in store for the field, now developed on a 40-acre pattern, with three wells producing, and three rigs now active. Several eminent engineers and technologists will testify at the February 4 hearing.

LOUISIANA

DAILY ALLOWABLE PRODUCTION for Louisiana fields during February has been set by the state Conservation Department at 294,942 bbl. daily, an increase of 2,168 bbl. over the January allowable. Of this increase, 1,733 bbl. will be given South Louisiana fields to bring their total to 227,308 bbl., while North Louisiana fields will be increased 453 bbl. to a total of 67,634 bbl. daily.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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Working Reserves

What is the significance of the 20-billion-barrel proven oil reserve in the United States? Recent answers to this question reflect widespread confusion within and without the industry.

In many legislative halls and in areas remote from the oil country there are those who believe that the 20 billion barrels represent the sum total of all oil yet to be produced in this country. Believing this they quickly get excited when someone points out that this is only a few years' supply, with the obvious conclusion that when it is gone something terrible is certain to happen—just what is limited only by the imagination.

Right now these fears are being tied with the defense program. Observers have visualized a future enemy landing on these shores with no opposition because the all-essential defense weapon of oil has been depleted by a wasteful people.

Probably the quickest answer to this ridiculous but politically dangerous viewpoint is to point to the parallel of the power dam. The power reserve of a dam is not the water backed up behind it but the vast drainage basin and the certainty, based on past experience, that new water supplies will be available to replace those which pass through the dam.

Another corollary lies in the fact that quantities of foodstuffs in storage at this time represent less than a year's supply. The alarmist can visualize an improbable series of catastrophies which would mean that new food supplies would not be produced. Others know that this year's supplies will come before last year's are depleted and this country's strong position in regard to food for peace or war is not in jeopardy.

Over the past year operators, including the revisions in their old fields, found more oil than they produced as they have for several years. They maintained their reserves at about 15 years' supply which gives them the protection needed in providing the current and future needs of their customers.

Conceivably there could be developments in supply or demand which would necessitate increasing this reserve to 20 years. There could be other changes which would reduce the present requirements.

Another fact to remember is that these crude-oil reserves are founded on today's markets. These huge underground stocks have been discovered on dollar-per-barrel crude oil. They could quickly be enlarged with prices 25 to 50 cents per barrel higher prices. At the higher market levels, operations not now feasible could be added to the established reserves and more widespread exploration for entirely new fields would be justified.

Finally, there is the flexibility in refinery operations which has direct importance in evaluating reserves. Present reserves are valued on a basis of yields of 43.5 per cent gasoline, 25 per cent residual fuel oil and smaller yields for other products.

This yield of gasoline could be increased 25 or more per cent with known refinery processing methods if the need arose and prices justified the additional costs of operation. All of the industry's manufacturing operations have a bearing on years' supplies of known reserves.

These comments may serve to illustrate the basic fact that the nation's known petroleum supplies underground at any one time, are its working reserves. The details of today's backlog are a feature of this Annual Review and Outlook Number.

At the same time we would not care to project the future accomplishments of the scientific and practical skill of this industry, wherein lies the final measure of its capacity to find oil. The technologists have kept ahead of demand in the past. If they are unhampered in their work there is every reason to believe they will continue in this outstanding achievement.

Divorcement Bill Hearings Scheduled in February

WASHINGTON, D. C., Jan. 28.—Hearings on two Gillette bills calling for divorcement of transportation, production and refining operations from marketing and prohibiting interstate common-carrier pipe lines from transporting commodities in which they have any interest are scheduled to be called within the next two weeks.

Senator Guy M. Gillette, of Iowa, sponsor of the measures, which were reintroduced when the last Congress failed to act on them, declared here that he is through holding off action on the bills. Senator Gillette took exception to elimination of the divorcement prayer in the Department of Justice antitrust suit against 22 oil companies, their subsidiaries and the A. P. I.

Meantime it appeared that all action in the House on similar bills sponsored again by Representative Vincent Harrington, of Iowa, and another Harrington bill prohibiting producers, refiners and marketers from operating tankers and barges, would be deferred until the return of Representative Cole, who is at home recovering from pneumonia.

Attaches indicated nothing would be done without Representative Cole's permission, and further it was unlikely action on these measures would be attempted by him until the subcommittee investigating need for federal control had completed its forthcoming hearings on national-defense requirements.

The Harrington bill against producer, refiner or marketer-owned and operated tanker or barge services, appears to be the net result of the several secret hearings conducted last year by a subcommittee of the House merchant-marine committee on tanker rates and practices and other phases of the water transport situation.

The marine subcommittee heard various industry groups and elected to forego even the formality of a report back to the full committee. Its authority expired with the last Congress.

One note of cheer for the industry in the legislative situation is struck by the attitude of the House ways and means committee as to the two bills reintroduced by congressmen from Pennsylvania which would impose federal taxes on fuel oil. These bills, being tax measures, go to ways and means group which is completely indifferent to them.

February Estimated Demand Increased 37,900 Bbl.

WASHINGTON, Jan. 28.—All oil-producing states excepting Arkansas, Colorado and New York participated in the distribution of 37,900 bbl. daily increase in estimated crude demand in February.

The daily average demand total of 3,628,900 bbl. daily is an increase of 37,900 bbl. over the January forecast and 39,300 bbl. greater than the actual for February, 1940. The largest increase was assigned by the Bureau of Mines to Texas where February demand was estimated at 1,312,900 bbl. daily, a gain of 15,400 bbl. over January.

The breakdown by states follows:

State	Forecast February 1941	Forecast January 1941	Actual February 1940
Texas	1,312,900	1,297,500	1,351,600
California	595,700	594,800	588,900
Oklahoma	442,500	439,000	396,900
Illinois	342,100	340,300	376,800
Louisiana	288,600	287,400	268,400
Kansas	193,200	191,000	167,500
New Mexico	100,700	100,000	102,600
Wyoming	74,600	73,900	77,900
Arkansas	66,100	66,100	61,600
Pennsylvania	50,000	48,000	54,300
Michigan	47,500	46,100	64,400
Indiana	22,500	20,000	7,100
Montana	20,000	19,000	15,800
Mississippi	16,100	15,200	6,000
Kentucky	15,400	14,800	12,300
New York	12,900	13,000	14,800
West Virginia	10,900	10,000	10,200
Ohio	10,100	9,000	9,900
Colorado	3,900	3,900	3,200
Nebraska	3,200	2,000	.....
Other	.....	.....	200
Totals	3,628,900	3,591,000	3,589,600

The bureau forecast motor-fuel demand for February at 40,800,000 bbl., including 1,800,000 bbl. for export compared to 44,900,000 bbl. forecast in January. The actual in February, 1940, was 39,460,000 bbl., including 1,903,000 bbl. moving in export.

Crude-oil requirements for February are set up by the bureau as follows:

	February	January
Gasoline yield per cent	42.49	42.59
Refinery crude required	99,310,000	108,420,000
Daily average	3,546,800	3,497,400
Foreign crude	3,500,000	3,700,000
Exports	3,500,000	3,900,000
Fuel and losses	2,300,000	2,700,000
Total demand for domestic crude	101,610,000	111,320,000
Daily average	3,628,900	3,591,000

Republic Buys Tanker

HOUSTON, Tex., Jan. 28.—Republic Oil Refining Co. has purchased a 33,000-bbl. tanker, the "Kewanee" from the Associated Oil Co. The vessel is now in drydock for inspection before entering service between Republic's refinery at Texas City and terminals at Hopewell, Va., Wilmington, N. C., Jacksonville and Tampa, Fla.

Alcohol Adulteration Would Raise Gasoline Cost 3 Cents Gallon

CHICAGO, Jan. 28.—United States automobile operators would pay approximately 3 cents per gallon more for their motor fuel if admixture of 10 per cent alcohol to refinery gasoline was made compulsory. This conclusion was reached in a new study by the A.P.I. committee on motor fuels published recently under the title of "Power Alcohol, History and Analysis."

"The use in gasoline of alcohol made from farm products is no more practicable today than at the beginning of its consideration 30 years ago," declared Arnold R. Daum, secretary of the A.P.I. committee.

The committee found that even cheaply priced farm products cannot be processed into alcohol for less than five to six times the cost of refinery gasoline.

"The claim that technical advantages of alcohol-gasoline fuels justify their extra cost is not supported by facts," the committee finds. "Use of a 10 per cent mixture would increase the nation's fuel bill by $690,000,000."

The study states that in net effect the alcohol scheme would be against farm interests "because farmers buy one-fourth of the motor fuel consumed, because relatively few could actually sell products to alcohol distilleries, and because of adverse influence on sales of other products, on soil fertility, and on independent farming."

Pretensions that alcohol is needed as a substitute for irreplaceable oil supplies, the bulletin declares, are answered by the fact that petroleum reserves are greater today than ever before, while conservation methods are still improving rapidly. Also, methods already developed of synthesizing oil from coal assure a continuing supply of oil as far into the future as any need can be foreseen, at cheaper prices than are in prospect for alcohol.

Seek Approval of Bylaws in Deep Rock Reorganization Plan

Approval of bylaws in the Deep Rock Oil Corp. reorganization plan will be sought February 4 in a hearing in Tulsa before federal Judge F. E. Kennamer. James F. Oates, Chicago, chairman of the reorganization committee, will present the bylaws and offer a proposed indenture under which a $5,500,000 note issue will be offered.

Fuel-Oil-Price Decline Hits Diesel and No. 2 Oils

NEW YORK, Jan. 28.—Decline of fuel-oil prices extended early this week to diesel oil and No. 2 burning material offered at New York terminals. Diesel prices were reduced January 28 to $1.85 per barrel, off 15 cents, and No. 2 prices to the tank-car consumers were lowered 0.2 cent to a general figure of 4.5 cents per gallon.

Natural Gasoline Association To Hold Annual Meeting in Dallas

The 1941 convention of the Natural Gasoline Association of America will be held in Dallas, Tex., April 23-25, at the Baker Hotel, according to an announcement by George P. Bunn, assistant head of the natural-gasoline division of Phillips Petroleum Co. and president of the N. G. A. A. Mr. Bunn has appointed the following men as the convention program committee:

T. R. Goebel, Shell Oil Co., Inc., Houston, Tex., chairman; H. H. Beeson, Sabine Valley Gasoline Co., Shreveport, La.; George E. Edgett, Carter Oil Co., Tulsa, Okla.; H. A. Ellis, Cities Service Oil Co., Bartlesville, Okla.; F. E. Fisher, Skelly Oil Co., Pawhuska, Okla.; R. D. Gibbs, Union Oil Co. of California, Los Angeles, Calif.; Allen T. Givens, Coltexo Corp., Monroe, La.

The committee in charge of local arrangements is:

J. R. Jarvis, Lone Star Gasoline Co., Dallas, Tex., chairman; John B. Atkins, Parade Gasoline Co., Inc., Shreveport, La., and A. M. Brackett, Roeser and Pendleton, Inc., Fort Worth, Tex.

Penn Grade Group Will Meet In Bradford Again

The Pennsylvania Grade Crude Oil Association has again selected Bradford, Pa., for its annual meeting. Dates have been set for June 19-20, according to an announcement following a board of directors' meeting in Oil City. Parker L. Melvin, Bradford producer, is president of the association.

Standard to Oppose Minnesota's Effort to Tax Gasoline on Corrected-Volume Basis

CHICAGO, Jan. 28.—Efforts of Minnesota to tax gasoline in shipments on a volume basis corrected for temperature will be opposed in the courts by Standard Oil Co. (Indiana). Attorneys for Standard of Indiana announced willingness to submit the question to the courts when it was reported that Minnesota's tax commissioner was planning to sue the company for $213,200 allegedly due on shipments since 1925. The tax claim is based on the volume corrected on a theoretical 60° temperature scale instead of on the liquid measurement.

Standard attorneys said that the gasoline-tax payments to and including 1938 had been in the exact amounts billed by the state. During 1939 and 1940 the state has been reserving the right to claim additional amounts if the theoretical gallonage at 60° should prove to be larger than the actual gallonage shipped.

DEATHS

WILLIAM T. WALLACE, vice president of Gulf Oil Corp., New York production division, died January 20 after long illness, in his sixty-ninth year at his home at Great Neck, Long Island.

Mr. Wallace's first connection with the oil business occurred in 1912 when he was made general agent of the Mexican Gulf Oil Co. with headquarters at Tampico. In this position he looked after the Mellon interests in Mexico until 1914. He returned to the oil business in 1919 and in New York City opened an office for the Gulf Oil Corp. to further the exploration and development of petroleum in foreign countries. For the past 22 years he had personally directed all phases of exploration work and oil-well drilling operations in Venezuela, Colombia, Panama, Ecuador, England, Denmark, and Kuwait, in addition to exploration for petroleum in many other South and Central American countries, Europe and the Near East. He was well known in the oil fraternity as a keen executive and organizer.

At the time of his death Mr. Wallace was vice president and director of the Gulf Exploration Co., Venezuela Gulf Oil Co., Mexican Gulf Oil Co., and vice president of the Gulf Oil Corp.

He leaves a widow, the former Elizabeth Cottrell, and one son.

CARLETON ELLIS, 64, chemical inventor who held approximately 750 patents, including many of those on the tube-and-tank cracking process which is used by most Standard Oil Co. of New Jersey plants, died of influenza at Miami Beach, Fla., last week. His inventions are credited with giving birth to more than 100,000 compounds, many of which spring from petroleum hydrocarbons. He was the author of several articles appearing in The Oil and Gas Journal. His volume on "Chemistry of Petroleum Derivatives" and a section on petroleum chemistry he edited in "The Science of Petroleum" are works long considered among the best reference material by refinery chemists.

WILLIAM E. EGAN, who retired on December 31 after 40 years of service with Oil Well Supply Co., died of a heart attack at his home in Denver, Colo., on January 14. He was born in Wooster, Ohio, in 1874. He is survived by his widow.

JAMES K. JOHNSTON, 86, who took part in the boom at Richburg, N. Y., in 1881, died on January 21. Born in Butler County, Pennsylvania, he worked as a tool dresser in the Clarion and Venango fields and later went to Bradford. He served as a driller in the Richburg field and was later employed by the Empire Gas Co. Later he was a producer and contractor in the field. He leaves his widow, one daughter and two sons.

FRED H. RAYMOND, 81, Ceres, N. Y., business man and oil producer, died at Olean, N. Y., on January 17. He was one of the organizers and officials of the Home Gas Co. He owned and operated a number of oil leases.

LEWIS R. ENSLE, 76, oil producer in the Plumer, Pa., district, died in Oil City January 24. He had been in failing health for the past year and had been seriously ill for 2 or 3 weeks.

RICHARD GUNDRY JENNINGS, president of E. H. Jennings Brothers Co., oil-producing concern in Pennsylvania, West Virginia, and western states, died at his home in Pittsburgh, Pa., January 23, after an illness of several months. He was a native of Bradford, Pa. He leaves his widow and two daughters.

E. CARLISLE NORWOOD, 55, independent operator and drilling contractor of Wichita Falls, Tex., died in a Wichita Falls hospital Tuesday, January 21, the victim of a heart attack. Having been in the oil business for 15 years in both Texas and California prior to settling in Wichita Falls in 1918, he was active in the North Texas district during its hectic shallow boom days. His latest activities were in the Fort Worth basin area of North Texas, where last year he opened the Hapgood field in Clay County.

T. W. McKEE, manager of Bell Refining Co. and secretary of Model Oils, Ltd., died recently at Calgary, Alta., Canada.

THOMAS EDWARD BURNS, chief accountant in the Calgary, Alta., office of Imperial Oil and secretary-treasurer of Royalite Oil Co., died on January 19.

HARRY C. MILLER, 59, retired general manager of the telegraph and telephone department of the Pure Oil Co., died at Ann Arbor, Mich., January 24. He had been in ill health for several years, and recently suffered a collapse. His widow and a son survive.

LEONARD F. NELSON, 41, public-relations director and advertising manager for the Oklahoma Gas & Electric Co., Oklahoma City, Okla., died January 25 from a heart attack. He had been ill with influenza for a few days before his death.

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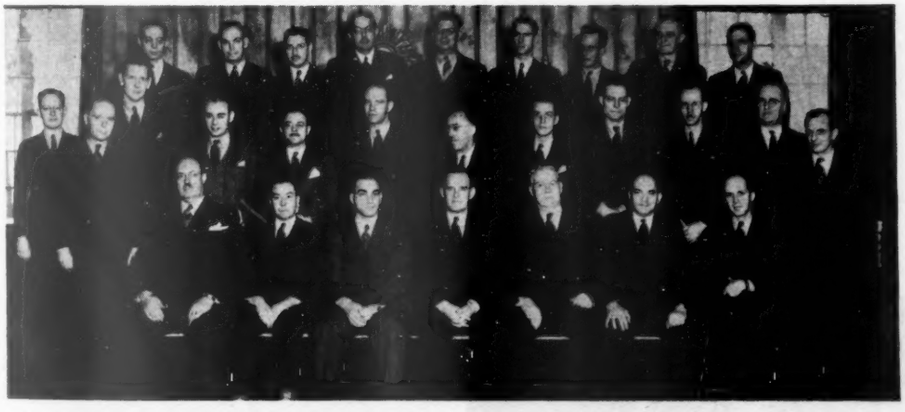
California Standard Places Tanker Lombardi in Coastwise Service

SAN FRANCISCO, Calif., Jan. 28.—Latest addition to the United States tanker fleet, the S.S. M. E. Lombardi, has been placed in the trans-Pacific and Pacific coastwise service by Standard Oil Co. of California. Delivery on the new tanker was made here last week after the boat completed its maiden volage from New York via the Panama Canal. The boat was launched September 28, 1940, at the Sun Dry Dock & Shipbuilding Co. yards in Chester, Pa. The new vessel has seven main cargo tanks and a deadweight capacity of 7,700 tons with a volumetric capacity of 60,000 bbl. Propulsion is with high-pressure steam turbine at 3,100 shaft hp. utilizing double reduction gears that will give the ship a speed of from 13 to 14 knots.

Standard of California's ocean-going fleet now consists of 17 vessels.

OIL TECHNOLOGISTS MEET AT STATE COLLEGE, PA. . . .



Shown here are those who attended the meeting of the technical advisory committee of the Pennsylvania Grade Crude Oil Association at State College, Pa., on January 21 and 22. They are:

Seated.—J. E. Moorhead, executive secretary, Pennsylvania Grade Crude Oil Association; Dr. F. L. Carnahan, assistant director of the petroleum refining laboratory, Penn State College; Dr. M. R. Fenske, director of research, petroleum refining laboratory, State College; Parker L. Melvin, Towne-Melvin Oil Co., president of the Pennsylvania Grade Crude Oil Association, Bradford, Pa.; H. C. Mougey, General Motors Corp.; Dean Frank C. Whitemore, dean of the school of chemistry and physics, Penn State College; L. A. Blanc, Caterpillar Tractor Co., Peoria, Ill.

Second row.—Paul W. Emery, United Refining Co., Warren, Pa.; W. W. Duniap, Pennsylvania Grade Crude Oil Association; L. E. Keller, Washington, D. C., of the National Petroleum Association; T. G. Murphy, Franklin Creek Refining Co., Franklin, Pa.; Dr. W. T. Sieber, Waverly Oil Co., Pittsburgh, Pa.; George M. Kirkwood, Pennsylvania Refining Co., Karns City, Pa.; C. M. Larsen, Sinclair Refining Co., New York; Robert E. Dunham, Sinclair Refining Co., New York; L. M. Beltzell, Wolf's Head Oil Refining Co., Oil City, Pa.; Willis A. Johnston, Bradford Penn Refining Co., Clarendon, Pa.; Frederic R. Speed, automotive engineer of the Pennsylvania Grade Crude Oil Association; Frank J. Philippbar, Kendall Refining Co., Bradford, Pa.

Rear row.—A. W. Lewis, Tide Water Associated Oil Co., Bayonne, N. J.; S. F. Pratt, assistant secretary, Pennsylvania Grade Crude Oil Association; Clifford Koch, Canfield Oil Co., Cleveland, Ohio; MacLean Houston, United Refining Co., Warren, Pa.; B. L. Heath, Freedom Oil Co., Freedom, Pa.; H. W. Hubbell, Valvoline Oil Co., Franklin, Pa.; W. B. Smith, Wolf's Head Oil Refining Co., Oil City, Pa.; L. W. Hodous, Canfield Oil Co., Cleveland, Ohio; H. L. Hemmingway, Kendall Refining Co., Bradford, Pa.

Others who attended but were not present when the photo was taken include W. B. McCluer, Kendall Refining Co., Bradford, Pa.; C. W. Georgi, Quaker State Oil Refining Co., Buffalo, N. Y., and E. E. Gilbert, Tide Water Associated Oil Co., Bayonne, N. J.

Frank J. Philippbar, Kendall Refining Co., Bradford, was elected chairman of the committee, succeeding P. M. Robinson, who obtained a leave of absence from the Pennzoil Co., Oil City, Pa., to serve as aide to Dr. R. E. Wilson, head of the Petroleum Section of the National Advisory Defense Council. The committee voted to send Mr. Robinson a letter expressing its appreciation for his service as chairman for 7 years.

THE MARKETS*

CRUDE OIL: The price advance of 15 cents per barrel Monday posted by purchasers in the Pennsylvania Grade area again focuses attention on the market strength of the industry's basic material. The January 27 advance was the third received in 90 days by Pennsylvania producers starting November 12. Adoption of 100 per cent tank-table purchase policies effective February 1 in Oklahoma and Kansas assures producers in those states of about the equivalent of 2.5 cents per barrel advance on $1 crude.

REFINERY: The interior-refinery market for distillate-fuel oils and kerosene is strong but these products are soft on the Gulf Coast and along the East Coast. Gasoline is relatively steady at unchanged prices. Advances ranging up to 0.4 cent per gallon were made at some of the more depressed points in the northeastern section. Residual and distillate fuels are actively sought by distributors in the Middle West. Premiums are being paid by some large buyers for fuels to augment their contract commitments.

TANK-WAGON AND POSTED DEALER: Kerosene tank-wagon prices were lowered 0.15 to 0.2 cent per gallon throughout most of the northeastern marketing territory. The decline applied to points in New England states, New York, New Jersey, and Maryland with scattered reductions extending to West Virginia.

FINANCIAL: Oil securities touched a new low for the decline that has been gradual since turn of the year. Average of 30 representative stocks for the week ended January 25: High, 23.75; low, 22.97; close, 23.52. Week ended January 18: High, 24.27; low, 23.22; close, 23.45.

*Detailed information in Market Section.

Refinery Expansion

Essex Places Plant on Stream After Extended Shutdown

BAY CITY, Mich.—Essex Refining Co. placed its 1,500-bbl. plant at Essexville, Mich., back on stream last week after a shutdown of several months for extensive repairs. Company officials said it was planned to run about 500 bbl. of Tuscola crude daily. The plant was completed in July of last year and has a daily capacity of 1,500 bbl. P. H. Hertzog is president of the company and Walter H. Bayes is superintendent.

Pecos Diamond Refinery at Artesia, N. M., Sold

ARTESIA, N. M.—Purchase of the Pecos Diamond Refining Co., Inc., refinery here by C. L. Talmadge and associates of Artesia has been announced. The plant, having a crude capacity of 325 bbl. daily, is to be doubled in capacity by the new owners and new equipment installed for manufacturing higher grade gasolines. The former operating company was headed by G. A. Grober.

Atlantic Employes Attending Classes in Refinery Methods

PHILADELPHIA, Pa., Jan. 28.—More than 400 employes of the Atlantic Refining Co.'s Point Breeze refinery in Philadelphia are now enrolled in night-school courses in petroleum refining in Philadelphia schools, H. R. Harris, the company's director of plant personnel, has announced.

"The recent amazing technological advances in petroleum refining make necessary the employment of the highest type of trained refinery-plant workers," Mr. Harris explained. "A recent check of our refinery workers and the supervisory staff shows that more than 60 per cent are at least high-school graduates."

Frontier Planning Cracking Unit at Cheyenne Plant

DENVER, Colo.—The Frontier Refining Co., with headquarters in Denver, has filed an application with the Securities Exchange Commission for authority to issue $175,000 in first mortgage 4 per cent bonds to defray part of the cost of installing a Dubbs cracking unit at its Cheyenne, Wyo., plant. M. H. Robineau, formerly with the Bay Petroleum Corp., is president. In a settlement of litigation last spring between Robineau and the Bay interests, the Cheyenne plant was turned over to him and put into the Frontier Refining Co. It has a capacity of 1,300 bbl. daily and obtains its crude from Lance Creek. It also operates 15 bulk and service stations in the surrounding territory.

Mid-South Refining Granted Mississippi Charter

BATON ROUGE, La.—The Mid-South Refining Co. has been granted a charter by Gov. Paul B. Johnson of Mississippi, to prospect for, produce, and refine petroleum, and market petroleum products in the state. The company recently announced its intention of moving the East Texas refinery of the bankrupt Hurricane Petroleum Co. to Mississippi to refine Mississippi oil, if granted the charter. The company, incorporated for a million dollars, has opened offices in Jackson.

Mexican Petroleum Corp. Raising Capacity of Savannah Plant

SAVANNAH, Ga.—Mexican Petroleum Co. of Georgia has inaugurated an expansion program at its 4,000-bbl. refinery here which will result in the refining capacity being increased some 500 bbl. daily. The work consists mainly of enlargement of the distillation equipment and adding about 100,000 bbl. tankage for crude oil and refined products.

Natural Gasoline

T. R. Goebel Appointed Chairman Of N.G.A.A. Program Committee

T. R. Goebel, superintendent of the natural-gasoline division of Shell Oil Co., Inc., Houston, Tex., has been appointed chairman of the program committee for the annual meeting of the Natural Gasoline Association of America to be held in Dallas, Tex., April 23-25. This will be the association's 20th annual convention and will be the first annual meeting held outside of Tulsa, although semiannual meetings frequently have been held in other cities. Headquarters for the Dallas meeting will be in the Baker Hotel.

Chosen to serve with Mr. Goebel on the program committee were: H. H. Beeson, Sabine Valley Gasoline Co., Shreveport, La. G. E. Edgett, Carter Oil Co., Tulsa; H. A. Ells, Cities Service Oil Co., Bartlesville, Okla.; F. E. Fisher, Skelly Oil Co., Pawhuska, Okla.; R. D. Gibbs, Union Oil Co. of Calif., Los Angeles, Calif.; Allen T. Givens, Coltexo Corp., Monroe, La.

J. R. Jarvis, general superintendent for Lone Star Gasoline Co., Dallas, was appointed chairman of the local arrangements committee. Other members of this committee are J. B. Atkins, president of Parade Gasoline Co., Inc., Shreveport; and A. M. Brackett of Roeser & Pendleton, Inc., Fort Worth, Tex.

Natural-Gasoline Production Decreases in November

Production of natural gasoline in November 1940, decreased according to the monthly report just issued by the Bureau of Mines. The daily average was 6,777,000 gal. in November as compared with 6,838,000 gal. in October 1940. Chief declines were registered in East Texas, Oklahoma City, and Rocky Mountain districts, the report showed. Production of the various districts for November 1940 and for the preceding month, in gallons, was as follows:

Appalachian, 8,127,000, 6,834,000; Illinois, Michigan, and Kentucky, 4,336,000, 3,873,000; Oklahoma, 32,622,000, 35,566,000; Kansas, 5,892,000, 5,674,000; Texas, 83,388,000, 87,324,000; Louisiana 9,816,000, 9,338,000; Arkansas, 2,836,000, 3,156,000; Rocky Mountain, 7,785,000, 8,694,000; and California, 48,520,000, 51,515,000.

Stocks of natural gasoline continued to decline, the total on hand at the end of November was 256,284,000 gal., as compared with 275,898,000 gal. in storage on October 31, 1940, and 192,318,000 a year ago. Stocks at refineries declined from 137,088,000 to 126,798,000 gal., while stocks at plants and terminals decreased from 138,810,000 gal. on October 31 to 129,486,000 gal. on November 30.

Shipments to jobbers and retailers decreased, the total for November being 25,704,000 gal. compared with 29,190,000 gal. in October. Exports increased and were 2,688,000 gal. compared with 1,806,000 gal. in October. The vapor pressure for shipments to refineries increased; that for all other shipments decreased. The weighted average for the month was 20.3 lb. compared with 18.7 lb. in October and 21.9 lb. in November 1939.

Cities Service Adds Compression Units at North Cowden Plant

ODESSA, Tex.—Installation of three 600-hp. angle-type compressors and one 800-hp. unit has been completed at the North Cowden field natural-gasoline plant of Cities Service Oil Co. Gasoline capacity of the plant, which is located in Section 34, Block 43, Township 1n, Ector County, is over 35,000 gal. daily.

News of Pipe-Line Activity, which was formerly found on this page, will be found on Pages 196-197.

INDIANA COOPERATIVE REFINERY AT MOUNT VERNON

Placed on stream in the first half of 1940, the Mount Vernon, Ind., refinery of Indiana Farm Bureau Cooperative Association, Inc., has been operating at near-capacity levels ever since. The plant is of 2,500 bbl. capacity, no cracking equipment being yet installed. A 1,600-bbl. unit, however, is being planned.

Natural Gas

Repressuring Plants Planned For Two Arkansas Fields

EL DORADO, Ark.—Two new repressuring plants are seen as a possible outcome of a hearing called by the Arkansas Oil and Gas Commission at El Dorado, February 4. The operators and royalty owners of nearly all producing properties in the Jones sand horizon of the Schuler field have drawn up a unitization and pressure-maintenance agreement which will be presented before the commission, and orders will be asked for placing the project under way.

Another field, the McKamie gas-condensate pool of Lafayette County, is believed due for a plant to process the high-pressure gas and return the gas to another more shallow horizon than the Smackover lime from which it is withdrawn. The pressure maintenance of the Smackover is made unnecessary by an active water drive which maintains pressure under present withdrawal rates.

PROGRAMS AND MEETINGS

Texas Mid-Continent Oil Men Select Beaumont for Convention

DALLAS, Tex., Jan. 28.—Beaumont was today announced as the meeting place in 1941 of the Texas Mid-Continent Oil & Gas Association by E. L. Smith, of Dallas, association president.

Dates for the 1941 convention were named as October 9, 10 and 11. The meeting will be the twenty-second annual gathering of the organization.

The decision to go to Beaumont was made after several invitations had been extended by the South Texas oil city. Nearly 1,000 Texas oil leaders are expected to attend the 3-day session.

Officers of the Texas Mid-Continent Oil and Gas Association are E. L. Smith of Dallas, president; George C. Gibbons, of Dallas, executive vice president; H. R. Cullen, of Houston, vice president for the Texas Gulf Coast; B. G. Byars, of Tyler, vice president for East Texas; J. L. Collins, of Corsicana, vice president for East Central Texas; D. Houston Bolin, of Wichita Falls, vice president for North Texas; Mel Davis, of Pampa, vice president for the Panhandle; Hamilton McRae, of Midland, vice president for West Texas; W. J. Rhodes, of Breckenridge, vice president for West Central Texas; Al Buchanan, of San Antonio, vice president for Southwest Texas, and Eugene McElvaney, of Dallas, treasurer.

Petroleum Geologists Making Plans for Annual Meeting in Houston

A feature of the twenty-sixth annual meeting of the American Association of Petroleum Geologists, which is to be held at the Rice Hotel, Houston, Tex., April 2-4, will be the association research committee's annual dinner and subsequent round-table discussion on "Future Possible Oil Provinces of the United States and Canada." Research-committee Chairman A. I. Levorsen states that no attempt will be made to appraise the possibilities quantitatively or on a barrel basis. The dinner is scheduled at 6:30 p. m. and the discussion at 8 p. m., Tuesday, April 1.

Other meetings on April 1 will be those of the research committee conference groups, six of them convening separately on Tuesday afternoon. On Tuesday morning the standing committees will hold their annual meetings.

The Society of Exploration Geophysicists will present its technical program on April 1-3, and the Society of Economic Paleontologists will be in session on April 3 and 4.

Petroleum Accountants to Hear Two Interesting Addresses

The January meeting of the Petroleum Accountants Society of Oklahoma will be held at 6 p. m., Thursday, January 30, in the Junior Ballroom of the Mayo Hotel, Tulsa. Gerald H. Westby, president of Seismograph Service Corp., will discuss "Recent Developments in Reflection Seismic Surveying.". Charles E. Votrian, treasurer of Bareco Oil Co., will discuss "Refinery Cost Accounting."

Mid-Continent A.P.I. Production Division to Meet in March

The regular spring meeting of the Mid-Continent district, Division of Production, American Petroleum Institute, will be held on Friday and Saturday, March 21 and 22, in the Herring Hotel, Amarillo, Tex. Further details of the meeting, including data on registration, entertainment, etc., will be furnished a little later on.

CALENDAR OF EVENTS

February

WISCONSIN PETROLEUM ASSOCIATION, annual convention, Milwaukee, Wis., February 11-13.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Engineering Societies Building and Commodore Hotel, New York, N. Y., February 17-20.

KENTUCKY PETROLEUM MARKETERS ASSOCIATION, fifteenth annual meeting and convention, Brown Hotel, Louisville, Ky., February 18-19.

NORTH TEXAS OIL AND GAS ASSOCIATION, Wichita Falls, Tex., February 22.

LIQUEFIED PETROLEUM GAS ASSOCIATION, INC., annual convention, Chicago, February 24-25.

AMERICAN PETROLEUM INSTITUTE, southwestern district regular spring meeting, Washington-Youree Hotel, Shreveport, La., February 27-28.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, Hotel Mayflower, Washington, D. C., March 3-7.

OHIO PETROLEUM MARKETERS ASSOCIATION, Deshler-Wallick Hotel, Columbus, Ohio, March 4-6.

PACIFIC COAST GAS ASSOCIATION, annual spring sales conference, sales and advertising section, San Francisco, Calif., March 6-7.

NATIONAL DIXIE DISTRIBUTORS, INC., Fort Worth, Tex., March 10.

AMERICAN PETROLEUM INSTITUTE, Pacific Coast District, Division of Production, regular spring meeting, Biltmore Hotel, Los Angeles, Calif., March 11.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners' and suppliers' exhibit, Hotel Severin, Indianapolis, Ind., March 11-13.

OKLAHOMA UTILITIES ASSOCIATION, annual meeting, Tulsa, March 17-18.

OIL BURNER INSTITUTE'S NATIONAL OIL BURNER PROGRESS EXHIBITION, Commercial Museum, Philadelphia, Pa., March 17-22.

MID-CONTINENT CHAPTER, AMERICAN PETROLEUM INSTITUTE, spring convention, Amarillo, Tex., March 21-22.

OIL TRADES ASSOCIATION OF NEW YORK, annual meeting, Waldorf-Astoria Hotel, New York, March 25.

PACIFIC COAST GAS ASSOCIATION, annual spring technical conference, technical session, Los Angeles, Calif., March 27-28.

April

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-sixth annual meeting, Rice Hotel, Houston, Tex., April 2, 3, and 4.

AMERICAN CHEMICAL SOCIETY, St. Louis, Mo., April 7-11.

MIDWEST POWER CONFERENCE, fourth annual meeting, Palmer House, Chicago, April 9-10.

SOUTHWESTERN GAS MEASUREMENT SHORT COURSE, College of Engineering, Oklahoma University, Norman, Okla., April 15-17.

WESTERN PETROLEUM REFINERS ASSOCIATION, annual meeting, Arlington Hotel, Hot Springs, Ark., April 16-18.

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, regular spring meeting, William Penn Hotel, Pittsburgh, Pa., April 17-18.

NATURAL GASOLINE ASSOCIATION OF AMERICA—Annual convention, Baker Hotel, Dallas, Tex., April 23-25.

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Mayo Hotel, Tulsa, April 23-25.

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Hotel Cleveland, Cleveland, Ohio, April 24-25.

May

PETROLEUM AND NATURAL GAS CONFERENCE, State College, Pa., May 2-3.

AMERICAN GAS ASSOCIATION, Natural Gas Section, Dallas, Tex., May 5-8.

WEST TEXAS GEOLOGICAL SOCIETY, annual spring field trip, starting at Fort Worth and ending at Midland, May 10-11.

AMERICAN PETROLEUM INSTITUTE, eleventh midyear meeting, Mayo Hotel, Tulsa, May 19-23.

NATIONAL OIL SCOUTS AND LAND MEN'S ASSOCIATION, annual convention, Dallas, Tex., May 29-31.

June

ILLINOIS - INDIANA PETROLEUM ASSOCIATION, ninth annual petroleum conference, Robinson, Ill., June 7.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting of Petroleum Division, Kansas City, Mo., June 16-20.

PENNSYLVANIA GRADE CRUDE OIL ASSOCIATION, annual meeting, Bradford, Pa., June 19-20.

AMERICAN SOCIETY FOR TESTING MATERIALS, forty-fourth annual meeting, Palmer House, Chicago, June 23-27.

September

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, East Texas chapter, annual convention, Adolphus Hotel, Dallas, Tex., September 25-27.

October

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, annual convention, Beaumont, Tex., October 9-11.

AMERICAN GAS ASSOCIATION, twenty-third annual convention, Atlantic City, N. J., October 20-25.

November

AMERICAN PETROLEUM INSTITUTE, twenty-second annual meeting, San Francisco, Calif., November 3-7.

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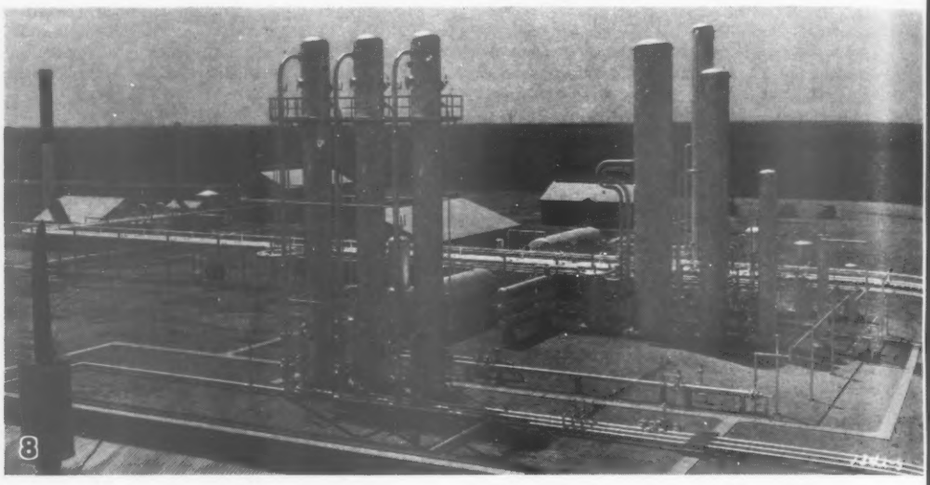
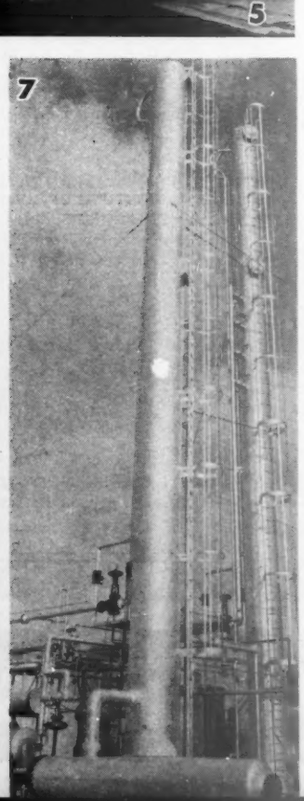
SPOTLIGHTING





1—Three Supreme Court decisions made 1940 another four-bell litigation year for the oil industry. The court did these things: (1) Affirmed a lower-court decision against Ethyl Gasoline Corp. liberalizing use of lead. (2) Affirmed convictions in the Madison case. (3) Upheld the Texas Railroad Commission proration policy in East Texas.

2—Atty. Gen. Robert E. Jackson filed the omnifarious antitrust suit September 30 against 22 major oil companies, their subsidiaries and the A.P.I. Oil-company ownership of pipe lines was attacked in separate suits.

3—Sec. Harold L. Ickes renewed his previously abortive struggle to gain control of the oil industry through medium of the Cole bill or similar legislation.

4—Extensive plans were made by the industry to meet any conceivable defense requirements. W. S. Farish, president of Standard Oil Co. (New Jersey), heads an all-industry committee sponsored by the A.P.I.

5—Dr. Robert E. Wilson, president of Pan American Petroleum & Transport Co., was drafted from the industry as technical adviser on petroleum to the N.D.A.C. Through his office the industry has been able to give refreshing assurance that there need be no fear of oil deficiency.

6—Rep. William P. Cole, Jr., of Maryland, called for additional hearings before the congressional subcommittee he heads on conduct of the petroleum industry. Insistence for another oil clinic came from the White House.

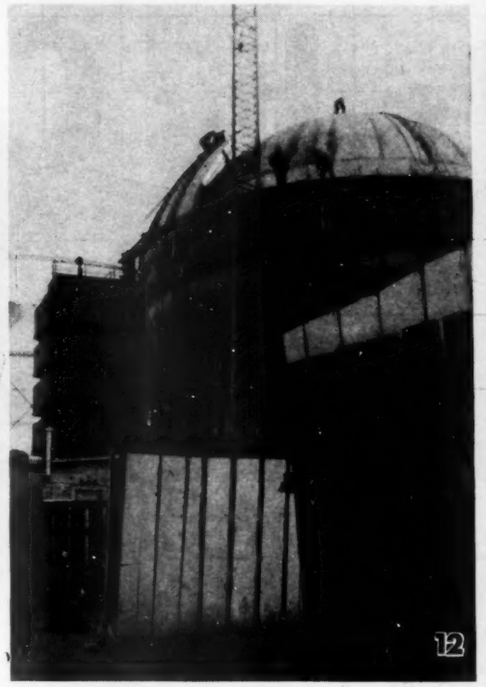
7—Problems in other defense industries became the concern of the domestic petroleum refiners opening new vistas for the inestimable number of hydrocarbon combinations in oil. One such project alone for the manufacture of explosives from oil on the Gulf Coast will cost $11,857,000.

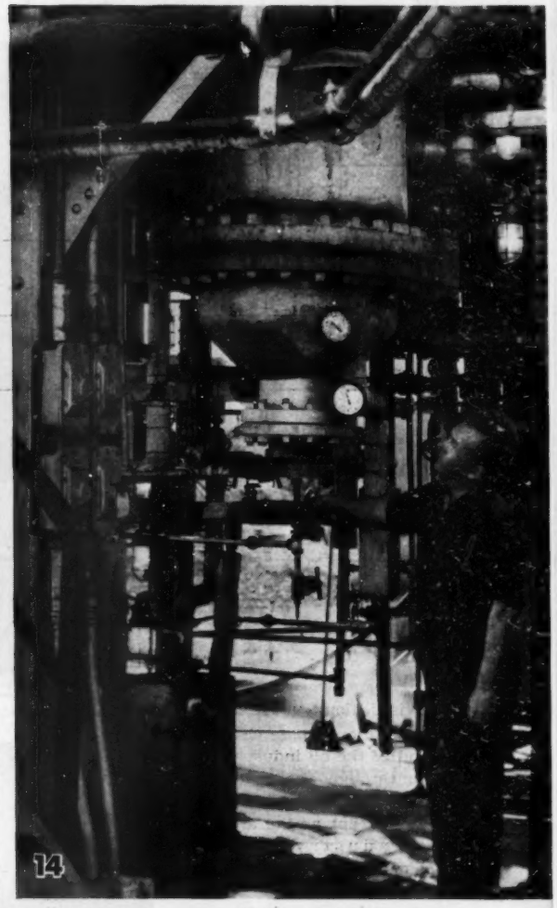
8—Recycling became a firmly entrenched operating practice during the year. Expansion of operating plants in Texas and Louisiana nearly tripled the condensate-producing capacity exerting strong influence on production, refining and marketing practices.

9—Opposition of railroads in granting right-of-way easements prevented operation of more than a short 98-mile segment of Southeastern Pipe Line Co.'s 450-mile gasoline pipe line from Port St. Joe, Fla., to Chattanooga, Tenn. The project, first gasoline line in the southeastern states, was the longest undertaken in 1940, a year in which about 6,000 miles of lines were laid.

10—Petroleum exports declined 30 per cent as the European war spread. Export-license control invoked against fuels. Japanese embargo threatened. Imports advanced 35 per cent. Thirteen per cent of the United States tanker

1940





tonnage was requisitioned for exclusive service with the Navy. Coastwise water-transportation rates boomed to record highs of 70 to 80 cents per barrel.

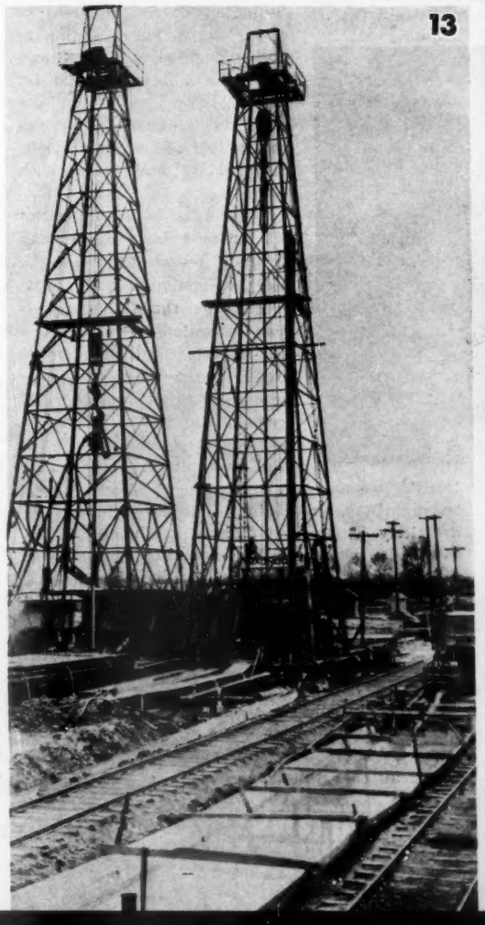
11—Domestic oil demand advanced to a record figure of about 3,607,000 bbl. daily, an increase of nearly 7.5 per cent. Six per cent increase in domestic motor-fuel requirements increasing demand to about 1,615,000 bbl. daily, compared to 1,514,000 bbl. in 1939, was important in cushioning the export decline.

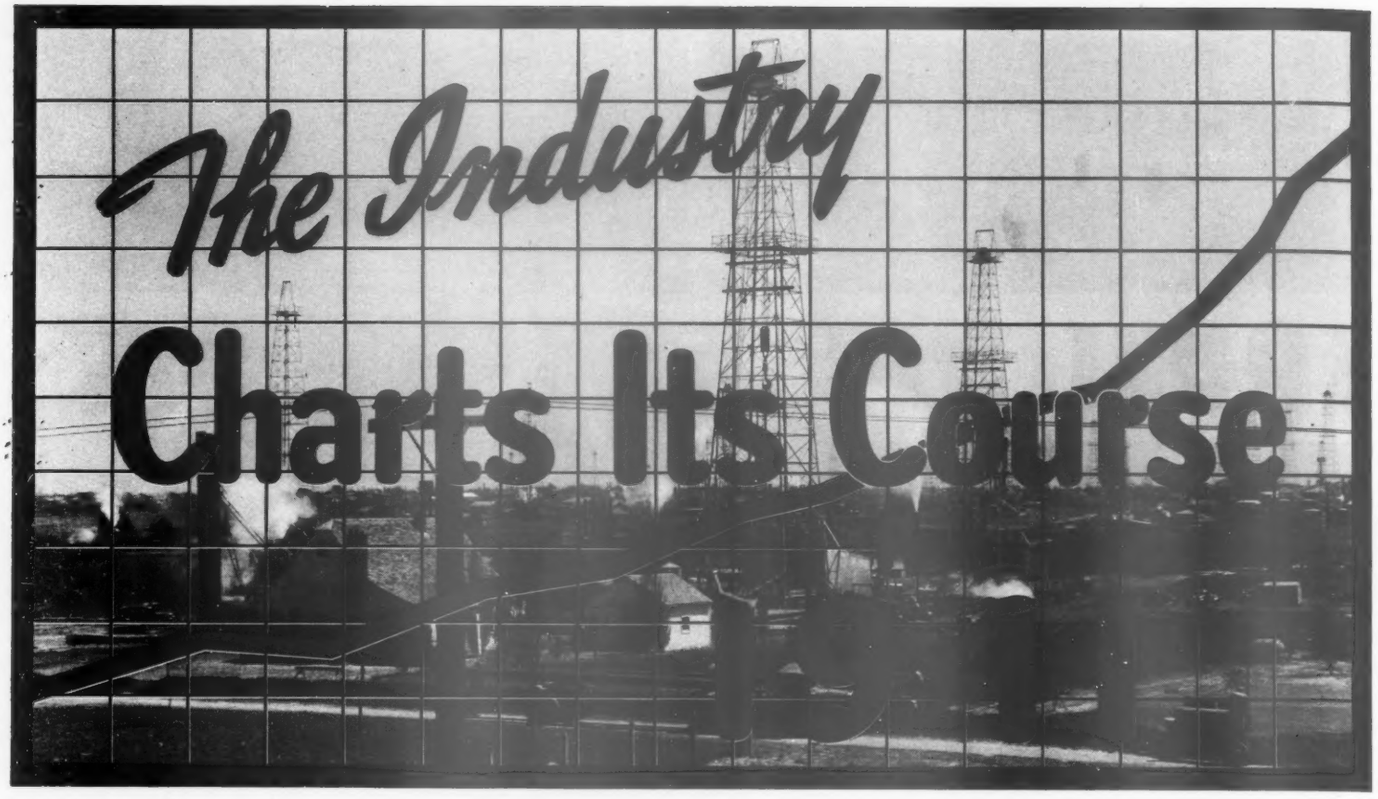
12—Development of the process for liquefaction, storage and regasification of natural gas gave the industry a new tool. Utility includes creation of reserves in liquid form where winter peak loads are high without the previously concomitant expense of adding otherwise unnecessary transportation capacity.

13—This type of spacing in development of small leases and multiple-producing zones in Illinois pushed the state's yield to a peak of 518,225 bbl. daily at midyear.

14—Construction of the country's largest commercial plant for manufacture of synthetic rubber from petroleum gas (butadiene) started at Baton Rouge, La., following long research.

15—All-out warfare felled France, closing a large market for American and Iraq oil, and threw most of its 175,000-bbl. daily refining capacity into idleness. Rumania's oil industry went completely under German domination.





Defense Preparation Calls For Inevitable Sacrifices

By R. L. COLLEY
President, Atlantic Refining Co.

IT is difficult under the best conditions to see clearly the trend of the oil industry's welfare through the hectic days ahead; it is impossible to foresee it except as the affairs of the industry are viewed against a background of the international situation. With more or less complacency, the immediate future months and near-term years are awaited as times of enlarged demand for petroleum products. Increases in demand growing largely out of the national-defense program are expected to reduce existing surpluses and bring corrections to an excessive productive capacity and a lagging return on the industry's investment.

Beyond doubt a larger demand is in the offing but it may be seriously questioned whether its fulfillment will be accompanied by an improvement in the industry's welfare. Has industry heretofore been so inefficient that now under the spur of the aggressor nations' threat to our security, an increased efficiency will provide guns and butter, too, where before we had only butter?

It is naive and illogical to expect the impossible. Some sacrifice will have to be made; some price will have to be paid for armaments and other defense preparations. We must face realistically the stark necessities of a threatening situation. Some reduction in the standard of living, some intensification of personal effort, and some curtailment of leisure must be written down opposite the costs of armaments on the ledger of an economy surrounded by and faced with war.

Those of us in the American oil business have more than ordinary reason to weigh the dire implications of the threat erected by the militarily aggressive nations. Already there has been lost, at least temporarily, a large segment of our foreign civilian market. In terms of the decline in our exports of gasoline, the facts are well exemplified and known. But the loss may not be temporary. Indeed, it may be greatly extended in volume and persist indefinitely. To understand the possibilities of the developing situation, it is necessary only to visualize the effect on our industry's welfare, should the totalitarian powers acquire the great near eastern and far eastern oil reserves. Surely then our former markets would not be restored to us nor even be accessible except after a great struggle and we might find ourselves forced to compete most strenuously to hold our remaining foreign markets. But this is not all. In terms of our entire economy and long before any direct attempt at the military invasion of the United States by an Axis combination, there should be expected an economic attack; first, against our European position; second, against our Latin-American enterprises, and then, against our Asiatic business; an attack which, abetted by the free use of the Axis powers' newly acquired petroleum supplies, might be difficult to repulse.

Strippers Need Considerate View of Their Problems To Aid in Defense Effort

By C. P. McGAHA
President, National Stripper Well Association

THIS is a period when stock is being taken of the nation's resources which relate to the national defense. At the moment that subject is uppermost in our thoughts. That condition promises to obtain for many months.

The petroleum industry is intimately related to the program of preparedness and it is fortunate for the nation that the industry can give assurance of adequate supply, for defense, industrial, and civil needs. A large part of that supply exists in the reserves underlying the stripper wells. They constitute a backlog of daily production whose decline is slow. The removal of these reserves from the petroleum supply might produce a shortage in national requirements.

It is, therefore, imperative that nothing be done that will further interfere with the operation of the stripper-well reserves. They have been greatly threatened in the past few years. Taxes have been increased. Costs of operation have been added to through social legislation, such as the wages-

hours act and the social-security taxes on the employer. Costs of equipment are higher. These increases in costs have not been accompanied by increases in the price of crude oil. On the contrary, the average price has been lowered. Under present conditions, most of these small wells are being operated at a loss and premature abandonments of them have been great. And, for the past year, imports have made greater inroads into the markets of the stripper-well producers.

The stripper-well industry asks no subsidies to enable it to make its proper contribution to the national-defense program. It does ask that its needs be recognized by state and national legislators and that no new obstacles be placed in its road.

●

Dictatorial Control Sure Way To Halt Discoveries

By LEON C. PHILLIPS
Chairman, Interstate Oil Compact Commission

LEON C. PHILLIPS

NATIONAL defense is a matter of vital concern to us all. The resources and energies of the nation in 1941 will be devoted to the defense program. The oil industry and the oil-producing states are ready and have already pledged full and complete cooperation.

This is one essential war industry that is completely ready to meet any national emergency. No subsidy, direction, or regulation is necessary. While we are confronted with bottlenecks and unpreparedness in other industries, there are none in the oil business. We are fortunate that we have ample reserves, production, transportation, and refining facilities to meet all possible war needs, as well as civilian consumption.

We may expect, however, a vigorous fight by those who desire to take over this industry and rule it from Washington. They will urge federal control as a national-defense measure. This will be an issue which we must face this year. Such a step would disrupt a highly efficient and fully prepared industry, and actually impair our national defense.

We must continue to encourage prospecting and discovery. To have oil we must first find it. In my judgment, the quickest and surest way to create an eventual shortage of oil in the United States would be to turn this business over to a commissioner in Washington with dictatorial powers.

1941 PREVIEW

On these and the following two pages, representative leaders voice opinions as to what the year holds for the industry. There is general agreement that first consideration should be given to the needs of the national defense. Some executives point out price evils that need correcting, while others speak out strongly for the need of combating the threat of government-control legislation. Other statements deal with special operating problems.

●

Reserves Make Industry Ready To Meet Emergency Demand

By E. B. REESER
President, Barnsdall Oil Co.

E. B. REESER

NEVER before in the history of the petroleum industry have there been so many confusing issues—so many problems that cannot be decided on the basis of experience.

The continuous increase in the market demand for petroleum products has been most gratifying and according to the Bureau of Mines estimate, the rate of increase will continue during the coming year.

The intelligent regulation of production in the principal producing states—with the exception of Illinois—has created a tremendous reserve of petroleum with a sufficient number of wells already drilled, which can be opened on a day's notice. This wonderful development of reserves has been created with a minimum of physical waste, so that in so far as the production branch is concerned, there isn't the slightest reason for any change in the present method of regulation.

Next to an adequate reserve of petroleum, transportation is the most important phase of the industry's activities. The fact that more than 100,000 miles of trunk and gathering pipe lines are in daily use in the United States indicates an operation of such magnitude that only those well informed can appreciate the efficiency which is necessary to keep this great stream moving.

The continuous round of prosecutions of the petroleum industry by the Government undoubtedly causes a great deal of confusion and wonderment as to what can be done safely to continue the development and expansion of all the facilities of the industry.

The prices for crude oil and the products therefrom have been for a long time—and are now—below the actual cost of production, plus reasonable allowance for depreciation, obsolescence, and exploration.

●

Legislation Inimical to Motor Transport a Dual Threat

By J. HOWARD PEW
President, Sun Oil Co.

J. HOWARD PEW

WITH Congress and most state legislatures in session, the next few months will see more legislative sniping against free movements of interstate trade and transportation. Under many forms of camouflage and pretense, the real inspiration to this crusade is the hostility of competing transportation interests against trucks.

The oil industry has many reasons to oppose this campaign. It is probably the largest user of truck transportation. I saw recently a list of the 65 largest truck fleets in the country. These 65 fleets totaled 130,460 trucks; and of them, 21 fleets, aggregating 36,717 trucks, were operated by oil companies! Plainly, this means that restrictions on the size, weights, and operations of trucks would injure the oil industry more than it would any other.

Then there is the loss that would follow restriction of our market for fuel oil. Somewhere from 30 to 40 per cent of all motor gasoline is used by trucks; whatever limits their operation lessens the demand for our most important product.

It is vitally necessary that no more barriers be set up against the free use of the highways, and that those which have already been set up be removed.

●

Conservation of Exchange Forces Canada to Extend Exploration

By G. HARRISON SMITH
President, Imperial Oil Co., Ltd., Toronto

THE objective of the Canadian petroleum industry for 1941 and as long thereafter as the existence of our democratic institutions is menaced, will be to give all possible assistance to a vigorous prosecution of Canada's war effort.

An important phase of this objective is the conservation of foreign exchange. Because of our enormous requirements of munitions and other supplies from the United States, every dollar of United States funds must be conserved by the Canadian Government and steps already have been taken by the government to prohibit or restrict imports of nonessentials. Petroleum plays a large part in Canada's war effort and is essential for the continued economic and industrial activity but exchange can be conserved to an important degree by substitution of domestic products for products that have hitherto been imported in finished state.

Exploration for domestic sources of crude oil are being carried on on an enlarged scale, for the industry is fully aware how great a contribution might be made to the war effort through discovery of new fields to supplement the production from Turner Valley, which is currently the only important producing field in Canada.

●

Greater 100-Octane Capacity And Tankers Chief Needs

By ROBERT E. WILSON
Technical adviser on oil to
National Defense Advisory Commission

AN up-to-date review of probable defense requirements for petroleum products confirms previous statements that in general the producing, refining, and marketing facilities of the industry are entirely adequate to meet defense needs. However, continued construction and ex-

tension of these facilities to keep up with the growing peacetime demand will be necessary if the industry is to continue in this favorable position. Additional construction also appears necessary to take care of probable 1942 requirements of 100-octane gasoline, but the anticipated requirements of 91 and lower octane can readily be met with present facilities.

The relatively tight tanker-supply situation now prevailing confirms the prediction that the transportation of crude and products to the East Coast constitutes the only serious problem in sight in the event of a real emergency in the Atlantic. While about 24 additional large tankers are scheduled for completion during 1941, they will not much more than take care of the prospective growth of peacetime demand under existing conditions, and do not leave adequate leeway for emergencies. To offset this, it is my opinion that the industry should definitely plan to use all its domestic tankers throughout the summer, constructing such additional tankage at Atlantic Coast terminals as may be necessary to iron out the seasonal fluctuations in requirements. In addition to this, encouragement should be given to the development of supplementary means of transportation which would help relieve the East Coast tanker situation.

In considering the adequacy of existing stocks, instead of relying on the customary comparisons against a year previous, the situation must be viewed against the background of the rapid prospective growth in demand as a byproduct of defense preparations, and the possibilities of emergency demands and interruptions of transportation which may occur during the coming year. Viewed in this light, the stocks of all products are, in my opinion, definitely not excessive, and in several respects are not as high as would appear desirable. For example, last month the East Coast stocks of gasoline were at the lowest level in nearly 4 years in spite of the fact that prospective demand is estimated by the Bureau of Mines as 7 per cent higher than last year, and 21 per cent higher than in 1937. These low gasoline stocks are, of course, largely offset by relatively large stocks of heating oils on the Atlantic Coast and of gasoline on the Gulf Coast, but by and large the industry must look forward to carrying larger stocks of finished products on the Atlantic Coast if we are to be adequately prepared to meet emergency demands without civilian curtailment.

Militant Opposition to Federal Control Is Urgent Need

OPPOSITION of the general industry to federal control will be relentlessly continued in 1941. Almost without exception respondents listed the need for even more militant opposition to the Cole and similar federal-control bills as among the most urgent problems of the year.

Here are excerpts from some of the replies dealing with the legislative problems:

A. C. MATTEI

President, Honolulu Oil Corp.

THE oil industry should have a year of great achievements in 1941 because it will be a year in which certain stresses and strains within the industry must find avenues for escape. Technical and engineering advances were rapid in 1940 and under the present emergency conditions these advancements will make much more rapid strides in all branches of the industry. There should be a better public understanding of the industry as a whole and the public must know that above-ground waste is reduced to a minimum and that the other problems confronting us are not of a nature that federal control could cure. All that federal control would do is to create a mass of new problems, some of which would have disastrous future results. Competitors of certain branches of the oil industry must also be awakened to the fact they should not use governmental agencies to fight problems arising from a healthy competitive condition.

With the active cooperation of the oil-producing states, as well as all branches of the industry, this year should see great strides made in the development of a better understanding and a practical solution of our conservation problems through the strengthening of the Interstate Compact Commission.

L. H. PRICHARD

President, Anderson-Prichard Oil Corp.

THE year 1941 will probably be one of the most momentous, insofar as the oil industry is concerned, that we have experienced since the start of the industry. Each year the products from crude oil have grown in importance to where at present the very life of our country, industrially, socially, and otherwise, is dependent upon these products.

Our federal Government, in its anxiety to prepare for the possibilities of the future, can obtain through private capital and private operation the desired results from the oil industry if the industry is told just what is expected. In my opinion it is not necessary to have government control in order to obtain this result, but a greater understanding and cooperation is unquestionably needed as between our Government and the industry, for the benefit of all. I look to see 1941 make history in the oil industry and to demonstrate further what this great industry means to the welfare of the people.

L. L. AUBERT

General Manager, Bankline Oil Co.

DURING the last 2 years, California production has been under restriction closely approximating market demand, which is generally agreed to be one phase of oil conservation.

In addition, all legislation necessary as a prerequisite to joining the interstate oil compact is contained in California's natural-resources code. In view of the latter fact, the California Legislature will be asked to pass an enabling act so that the state may become a full-fledged member. The legislature may also be asked to pass a control law. While the matter has not been definitely decided, many operators are now discussing it as a possible preventive of federal control, toward which there is unanimous opposition.

W. A. GOFORTH

President, Oklahoma Stripper Well Association

MACHINERY for government aid is already set up in the form of the interstate oil-states compact. This organization, acting through its member states, is able to regulate the greater part of the nation's crude-oil supply and if supported by the crude-oil purchasers, will be able to establish immediately a form of pipe-line proration in the remaining areas until such time as they may become members of the compact.

The crude-oil purchasing companies owe it to the industry to cooperate by plugging the only hole in our otherwise perfect plan and at the same time, remove the one plausible excuse for federal control of the oil industry.

N. W. SHIARELLA

President, Kentucky Oil and Gas Association

NUMEROUS small independent producers in this area fear that, due to war pressure for conservation, Congress might enact some regulatory legislation which might be difficult to repeal after the emergency has passed. We within the industry know that the industry can very well meet the fuel requirements of our National Defense Council.

We should anticipate the barrage of propaganda that will undoubtedly emanate from those who are attempting to establish federal control of the oil and gas industry. The industry should set up a public-relations bureau to educate the general public, through the medium of newspapers, magazines, and radio, to the effect that the petroleum industry can and will meet the requirements of our National Defense Council.

Every oil-and-gas-producing state should pass some type of conservation bill in order that there will not be much justification for federal control.

Profitable Operation First Essential to Industry Health

DESIRABILITY of placing the entire industry on a more reasonable profit basis is clearly indicated as an incontrovertible incentive for 1941, particularly in light of the disappointing aspects of 1940.

Views expressed in quotations from the following leaders of the industry are typical of hundreds. They had this to say in direct or indirect relation to the economic aspects:

ALEXANDER FRASER

President, Shell Oil Co., Inc.

THE year 1941 offers the oil industry two exceptional opportunities: To be of service to

L. H. PRICHARD

W. A. GOFORTH

N. W. SHIARELLA

L. L. AUBERT

RALPH T. ZOOK

FRANK BUTTRAM

WINSTON P. HENRY

W. A. DELANEY

T. H. BARTON

ALEXANDER FRASER

the Government in its defense plans and to maintain its own economic house in good order.

From the national-defense viewpoint, the oil industry is in the fortunate position of having developed capacity in production, refining, transportation, and marketing sufficient to meet any reasonably expected requirements during 1941.

With a surplus of production and refining capacity, the industry is prone to accumulate excessive crude and product inventories in anticipation of expected increases in demand. The inevitable effect is an unremunerative price structure despite a satisfactory volume of trade.

While the current statistical position, particularly on the demand side, is fair in certain respects, the extremely poor gasoline market structure and the continuance and increase in the high level of refinery runs suggest the immediate advisability of curtailment of refinery operations to a more moderate level. Stocks of distillate fuels are now some 10,000,000 bbl., or 30 per cent above last year's level, which lends further support to the advisability of reducing refining activities, particularly as improved flexibility in adjusting refinery yields has been demonstrated by last year's experience.

J. ELMER THOMAS

Petroleum Analyst

FROM a supply and demand situation the outlook for the oil industry in 1941 appears to be fairly satisfactory. From the standpoint of petroleum prices the situation is very unsatisfactory. The defense industries must obtain adequate supplies of the petroleum products they will require and at reasonable prices to assure that the industry should be upon a sound financial basis. This latter is impossible while substantial quantities of petroleum products are being sold below cost.

The producer is entitled to the return of his costs plus a reasonable profit. The refiner is equally entitled to a return of his costs for raw material, refining, transportation and marketing plus a reasonable profit. Yet we observe today's situation wherein the price structure rarely, if ever, permits the posted prices for most grades of crude oil, prudently refined in a modern and efficient plant, to be realized from the prevailing quotations for petroleum products.

The maintenance of our national economy, stability in the oil industry and security in national defense all dictate that reserves be maintained at least near present levels and if the new supply is costing materially more than present-price levels, as the best evidence discloses, it may prove to have been wasteful if not dangerous for the nation to consume our present available supply at price levels largely determined by the lowest cost producers. That is not true conservation.

T. F. BIRMINGHAM

President, Margay Oil Corp.

PRESERVATION of the oil industry appears to me to be of paramount importance to the owners as well as to the nation.

Nearly one-half of our profit today is by virtue of the depletion law. Everyone appreciates the fact that Government will have to increase taxation. If in doing this the depletion law is also repealed or reduced we will see all profit, on the present market price of oil, disappear.

I see no justifiable reason for the current low market for crude oil and think we are entitled to a minimum increase of 25 cents per barrel over the present price. If the independent producers are to pay increased taxes, lose the benefits derived from percentage depletion, and survive, the price increase becomes imperative.

RALPH T. ZOOK

President, Sloan & Zook Co.

THE beginning of 1941 finds the Pennsylvania Grade area producer in a very strong position with a demand for crude in excess of current production and an advancing price. Water-flooding operations expanded materially during 1929 and subsequent years. The production due to this method has now passed its peak. Barring new fields or a new method of recovery, 1940 saw the last serious overproduction period of the Pennsylvania area.

The refiner on the other hand enters the year in the temporarily embarrassing position of a strong neutral demand with low inventories; a shortage of his raw product, crude oil when crude is processed to supply this neutral demand; and low bright-stock and steam-refined demand with large inventories.

The economics of the present situation will cause a reduction in runs to stills and as this correction is made, crude will not be available at a price to profitably supply products to the lower-priced outlets.

FRANK BUTTRAM

President, I.P.A.A.

OUR principal objective during 1941 should be the largest possible contribution to the defense program. Its known reserves, potential production, refinery facilities, trained personnel, transportation equipment — all these can fulfill the pledge that this industry could deliver the desired quantity of any petroleum product at any time at any place.

The Interstate Oil Compact may afford the medium through which sound conduct might be fostered. If the industry sets its example of self-control voluntarily without outside pressure, then those who now advocate federal control will recognize the ability of the industry to govern itself. Self-government joined with state regulation ought to be one of our great objectives for this present year.

H. S. MILAM

Petroleum Engineer, Phillips & Milam

WE of the stripper-well area of northeastern Oklahoma look forward to the continuation of the 27.5 per cent depletion deduction, the elimination of the threat of control by some federal agency, the adoption of the 100 per cent tank-table purchasing policy, and suitable changes in the law governing wages and hours.

The water-flooding method of secondary recovery will continue to replace gas repressuring, with the continued expansion of the present projects, and development of new projects. Production may be expected to be maintained at about the present rate, requiring many wells to be drilled, and much equipment to be purchased.

Only slight changes will be made to water-treating and water-pumping plants, unless some method is devised to inject some subsurface water without treatment.

F. E. HOLSTEN

Vice President, Chalmette Petroleum Corp.

DURING 1941 the industry should do what is necessary to get its house in order so that it may be prepared for less prosperous periods after our defense program is completed. If we don't do so we are going to quickly find ourselves under government control, which might be disastrous and which no one wants.

It would or should be safe to assume that there is a relationship between the cost of crude and the selling price of the refined product. Unity cannot result when no consideration is given to prices that marketers must pay for products.

Thought should be given to crude-oil prices in keeping with prices refiners must accept from marketers who face competition from producers

(Continued on Page 170)

C. L. HENDERSON

T. F. BIRMINGHAM

E. G. SEUBERT

F. E. HOLSTEN

Completions in 1940 Show Good Record of Success

By W. V. HOWARD

THE total of completed wells in 1940 was 30,040, representing an increase of 3,201 over 1939 and making 1940 the industry's second most active year, being exceeded only by 1937. Of the completions, 21,103 were oil wells, representing 70.2 per cent of the total. This compares with 19,121 wells or 70.4 per cent in 1939, and 23,600 wells or 72.5 per cent in 1937. Gas wells show an increase from 2,031 or 7.6 per cent in 1939 to 2,404 or 8 per cent. In 1937, 2,540 gas wells were completed, or 7.8 per cent of the total. Dry holes were 6,533 in number or 21.7 per cent of the total, contrasting with 6,355 or 23.7 per cent in 1939, and 19.7 per cent in 1937. This indicates a decline in wildcatting during the past year because of the number of proven inside locations to be drilled and the concentration of expenditures in these fields. Production increased 6.6 per cent during the past year, based largely on the drilling up of acreage proven during 1939.

Eastern District

Drilling in the eastern district, composed of the Appalachian fields, Ohio and Kentucky, showed a decided increase over last year. In the whole area, 7,631 wells were drilled as compared with 5,729 in 1939. Good prices for crude in the Bradford district accounted for much of this increase and activity declined during the third and fourth quarters as prices dropped. Increased prices during the latter few weeks of the year may be reflected in a slight upturn during 1941 but it does not appear likely that 1940's figures will be duplicated.

One fact of significance can be gleaned from the records, namely, that there is a decided upturn in the demand for gas throughout the East. Gas wells in the five-state area increased from 1,256 to 1,650, an increase of 29.4 per cent as compared with an increase of only 18.4 per cent for the country as a whole. Percentage of total gas wells in this area is 68.6.

Prospecting for gas was successful in West Virginia and in the old district of Ohio. A campaign was under way in eastern Kentucky at the end of the year. During the year, there was considerable excitement over a boom in northeastern Ohio but this subsided as well after well proved dry, many of them finding the Oriskany absent.

Summary of Completed Wells in All the Fields of the United States in 1940 and 1939

		Comp.	Oil wells	Init. prod. (bbl.)	Av. init. prod. (bbl.)	Gas wells	Dry holes
Eastern	1940	5,821	4,587	11,201	2.4	890	344
	1939	3,961	3,149	41,121	13.0	627	205
Ohio	1940	1,227	323	4,596	14.2	504	400
	1939	1,034	183	3,505	19.2	489	352
Indiana	1940	504	231	32,124	139.1	53	220
	1939	371	176	27,454	155.9	37	156
Kentucky	1940	583	224	13,581	60.6	231	128
	1939	734	275	14,847	53.9	147	312
Michigan	1940	1,104	536	115,241	215.0	50	518
	1939	1,392	813	434,492	534.5	52	527
Illinois	1940	3,814	3,049	1,889,544	617.4	15	750
	1939	3,582	2,943	838,989	284.7	18	621
Mississippi	1940	210	107	59,233	575.1	1	102
	1939	32	9	5,600	622.2	1	22
Alabama	1940	11	0	0	0	0	11
	1939	2	0	0	0	0	2
Florida	1940	5	0	0	0	0	5
	1939	2	0	0	0	0	2
Georgia	1940	2	0	0	0	0	2
	1939	1	0	0	0	0	1
Kansas	1940	1,817	1,410	648,660	460.0	65	342
	1939	1,358	977	422,394	432.3	72	309
Oklahoma	1940	1,834	992	205,834	207.5	165	677
	1939	1,761	1,045	205,367	196.5	113	603
North Central Texas	1940	2,755	1,762	798,635	453.3	37	956
	1939	2,526	1,505	788,391	523.5	42	979
Eastern Texas	1940	621	438	41,138	93.9	59	124
	1939	698	502	46,444	92.5	38	158
West Texas	1940	1,855	1,725	1,529,846	886.9	11	119
	1939	1,870	1,703	1,464,169	859.1	4	163
Texas Panhandle	1940	560	455	122,912	270.1	81	24
	1939	442	328	116,068	354.8	81	33
Southwest Texas	1940	2,071	1,275	160,266	125.7	70	726
	1939	2,424	1,592	204,591	128.5	87	745
Texas Gulf Coast	1940	1,232	977	281,196	287.8	31	224
	1939	1,365	1,053	315,651	299.8	62	250
Louisiana Gulf Coast	1940	989	741	227,774	307.4	12	236
	1939	835	582	184,496	317.9	11	242
North Louisiana	1940	668	498	51,044	102.5	27	143
	1939	537	289	68,200	235.9	87	161
Arkansas	1940	179	114	31,996	880.7	5	60
	1939	254	183	88,435	483.1	6	65
Nebraska	1940	64	32	12.658	395.5	0	32
	1939	2	1	130	130.0	0	1
Missouri	1940	38	0	0	0	10	28
	1939	46	0	0	0	9	37
Montana	1940	234	155	17,479	112.8	41	38
	1939	170	114	9.728	85.3	19	37
Wyoming	1940	179	124	90,183	727.3	8	47
	1939	150	99	86,504	873.7	10	41
Colorado	1940	19	10	1,304	130.4	1	8
	1939	25	7	895	127.9	1	17
New Mexico	1940	611	479	165,449	345.4	19	113
	1939	606	525	202,250	385.2	18	63
Utah	1940	3	0	0	0	3	0
	1939	0	0	0	0	0	0
California	1940	1,030	859	765,299	890.5	15	156
	1939	1,160	852	774,629	909.2	13	251
Total	1940	30,040	21,103	7,277,193	344.8	2,404	6,533
	1939	26,839	18,453	6,344,650	343.8	2,031	6,355
Difference		3,201	2,650	932,543	1.0	373	178
	1938	27,149	19,121	6,810,743	356.2	1,985	6,043
	1937	32,560	23,600	8,091,294	342.9	2,540	6,420
	1936	25,888	18,525	6,460,140	348.7	2,068	5,295
	1935	21,420	15,108	5,669,934	375.3	1,401	4,911

Michigan and Indiana

Activity in Michigan showed a pronounced decline, even with increasing prices and declining production. This was due largely to the lack of successful wildcatting. For several years, Michigan has lived from hand to mouth, with rarely much over 4 years' supply in sight, yet always finding new reserves to balance production. This year the program did not work although gas reserves were greatly enlarged by important discoveries in Clare, Missaukee and Osceola counties.

In Indiana, the year moved along without any particular change, except for the drilling up of the Griffin and New Harmony pools in Gibson and Posey counties. This activity is continuing into the new year and may be maintained for some time. However, unless another equally important pool is found, Indiana's activity is due to decline in a few months.

During the year, Walker was almost completely drilled up but in December the Tallmadge sector produced some abnormally large wells which may lead to a revival here. Wise and Adams were also active and more drilling will take place in these pools during 1941.

Illinois

The record of 1939 in Illinois was surpassed in 1940 in both oil wells and dry holes. The yearly record, however, tells but half of Illinois' story. The completions by months, as presented on Page 139, show a decided increase in oil-well completions up to the middle of the year followed by a decline to about 50 per cent. The dry-hole record, on the other hand, increased to August and has since declined only about 30 per cent. The drilling boom that maintained Illinois' record was mainly the Centralia and Salem Devonian play and the White County and Hamilton County activity. The latter retarded the decline in Illinois production as pool after pool was found and drilled up. Today, with the exception of scattered activity, especially in Jasper County, Illinois appears to be settling down to a period of

routine drilling. The most active area is again Salem, as a result of the discovery of oil in the Trenton, but this activity consists of deepening depleted Devonian wells and is not, therefore, reflected in the completion figures.

Forest City Basin

The Forest City basin play showed further signs of petering out in all but the Falls City sector. Here 32 oil wells were drilled, two of them opening pools. Missouri had a number of dry holes with some small gas wells, and in Nebraska, the dry holes just balanced the successful completions. Of Missouri's 28 dry holes, 20 were drilled during the first 7 months, indicating the rate at which this play is subsiding.

Oklahoma and Kansas

Oil completions in Oklahoma dropped 53 wells while dry holes increased by 74. The Cumberland pool, discovered in 1940, is entirely held by one company which insures a steady and, possibly, slow drilling campaign. The discoveries in Okfuskee County are all of small size and will not require much drilling. The plays at Dill and West Hewitt are subsiding. More than at any period in its recent history, Oklahoma needs new oil fields.

In the Greater Seminole area, Bebee is in its fourth development period with newly discovered extensions opening up additional areas. The recent drilling campaign in the St. Louis field is about over. Even though 992 oil wells were completed in 1940, there is a net decline of producing wells of 977.

Thus, there appears to be little doubt but that Oklahoma is entering into a period of widespread wildcatting in order that the state's reserves may be brought back to normal again.

In Kansas, the picture is almost exactly the reverse of that in Oklahoma. Oil-well completions are up 44 per cent, while dry holes are up only 11 per cent. The nonprorated fields have stayed at practically the same level as in 1939 while wells in prorated fields have risen practically 20 per cent. Stafford, Barton, Ellis, Ellsworth, McPherson and Russell counties have all been active and in each case wells have been drilled which connect up pools formerly considered as separate. Each of these connecting links adds to the activity as offsets are required and the end is by no means in sight. With Illinois dropping off and Oklahoma fighting hard to maintain its position, the immediate future looks bright for Kansas. It must be pointed out that it has looked bright before but the cashing in has not materialized because of developments closer to the market. Operators are hopeful that nothing will prevent them from developing Kansas' oil in 1941 and are, at present, unable to see where any hindrance will be found.

Permian Basin and Panhandle

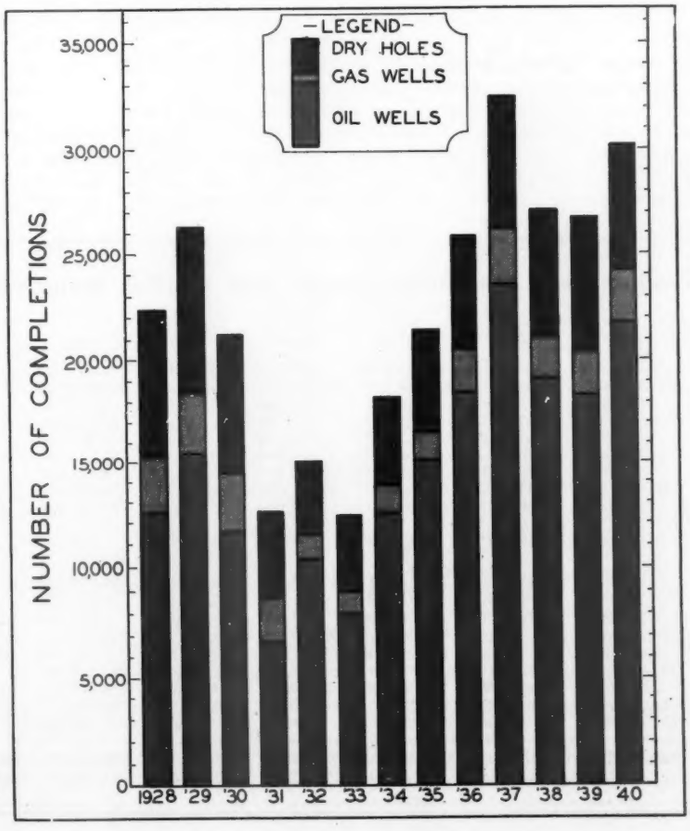
The picture in the Permian basin is very similar to that in Kansas, and, of course, the two areas are not in direct competition. The large blocks owned by individual operators make development in West Texas a slow and orderly process and this is indicated by the steady increase in the number of producing wells in McElroy, Goldsmith, Wasson, Cowden and other fields. Even such fields as Big Lake, McCamey and Chalk-Settles, which were thought to be about drilled up, forged steadily ahead. It is believed that activity in West Texas could continue at its present level for 2 years without any additional discoveries.

Meanwhile, the discoveries are far from lacking. Slaughter, with three fields last year, is now a 50,000-acre field with a possibility of still greater expansion. Deep sands in Wasson, in Crane, Pecos and Crockett counties, indicate the possibility of a deep-drilling campaign which will double this activity. Steadily the wildcatters push their way to the north and others crowd in between pools believed definitely bounded and drill the wells which prove to be connecting links. This process of making bigger pools out of already large ones goes on around Yates, in Ward and Winkler counties, and in Ector until a dry hole has almost come to mean an invitation to find the pool a few locations off.

In New Mexico, the same thing is happening and Eddy County is coming into its own. For many years this area has not been highly regarded because small wells were the rule. A 125-bbl. well at 4,000 ft. is not attractive until it is realized that it will be right up there for many years. Some of the early wells in Maljamar, for example, have shown little falling off and, as is usual in this area, there are always shallow sands to which wells can be plugged back when deeper pays are depleted. As a result, Grayburg-Jackson is up 65 per cent, Leonard, Loco Hills, Maljamar, and Shugart are nearly doubled and there is still a lot of cow pasture between wells.

Turning to the Panhandle, we find that Gray and Hutchinson counties are still pushing ahead and, since the Panhandle enjoyed its second-best year last year from the standpoint of cash return, it can be expected that they will continue to do so. The oil is known to be there when wanted.

Well Completions Over a 13-Year Period Showing Number of Oil Wells and Gas Wells and Dry Holes Recorded



West Central Texas

In West Central Texas, activity is moving westward and Jones and Shackelford counties are becoming as thickly drilled as the old Ranger area. In North Texas half of the activity is farther afield and the other half is right in the middle of the old districts. Archer, Wichita and Wilbarger counties are being drilled just as thoroughly and as successfully as are Clay and Montague. Deep drilling is the rule here, although there were seven discoveries above 2,000 ft. Few wildcats get below the Pennsylvanian but some have picked up production in Mississippian and Ordovician limes, indicating a possibility for another deeper play in the future. The greatest drilling campaigns in pools under development were in Walnut Bend and Hull-Silk. With 10 pays, the latter is set for a long period of activity.

Eastern Texas

Just when operators were set for a period of gradually declining activity in this area, which has not shown much since Rodessa and Talco, Chapel Hill and Hawkins came along. Hawkins, in particular, has intrigued the driller because of the 100-ft. section of Woodbine sand and many have visions of another East Texas.

Arkansas and North Louisiana

The year was largely one of disappointing results in Arkansas. Of the four discoveries, two were moving along near the end of the year, namely, Nick Springs and Urbana, where a new sand was picked up. Neither, however, promises to match Magnolia and Buckner. New developments in Arkansas failed to keep abreast of abandonments and the state had 114 fewer wells at the end of the year than at the beginning. There is no sign as yet that this trend will be reversed in the near future.

In North Louisiana, on the other hand, the old Caddo field keeps plugging steadily ahead with a net increase of 177 wells and a tendency to increase production. Far to the southeast, in La Salle Parish, where the old Tullos-Urania field was a lone outpost, two fields were under development and others were in prospect as wildcatters tried to duplicate the Olla and Nebo discoveries in an active Wilcox play. By the end of the year an even 100 wells were drilled in these two fields with more in prospect. In addition to the two oil fields, two gas fields were also opened up.

Mississippi and Southeast

Wildcatting in Mississippi was far from successful as 95 tests were drilled with only one small success at Pickens. Tinsley kept growing, however, as new wells found increasing thicknesses of Woodruff sand and two additional sands, the Perry and Tuscaloosa, were picked up during the year. The field is not yet bounded, so that there is plenty of room left.

Meanwhile, operators refuse to believe that this area contains only one Tinsley and are pushing their tests farther afield. Several interesting showings were found, both in Mis-

(Continued on Page 168)

1940 Production Sets All-Time Record of 1,338,237,138 Bbl.

THE oil fields of the United States produced in 1940, 1,338,237,138 bbl., or 82,453,604 bbl. more than in 1939 and 74,120,036 bbl. more than in the previous peak year of 1937. Expressed in percentages, this represents an increase of 6.6 per cent over last year and of 5.9 per cent above any year in American petroleum history. Of the big three states, Texas had a very small increase, only 2,297,525 bbl.; California dropped 324,103 bbl.. and Oklahoma's production declined by 3,818,679 bbl. and the state barely retained its position in third place.

In fourth place was Illinois, which increased its production by 54,653,635 bbl., or 59.5 per cent, exchanging positions with Louisiana which held fifth place. The latter state also had a production increase, in this case of 9,292,984 or 9.9 per cent. Sixth on the list of producers was Kansas, with an increase of 5,782,224 bbl., or 9.8 per cent. New Mexico was in seventh place with an increase of about 3 per cent. A big gainer was Wyoming which had an increase in production of 4,852,120 bbl., or 22.8 per cent, and passed both Michigan and Arkansas. The latter state also increased its production by about 20 per cent, but Michigan took a 3,819,438-bbl. drop. Pennsylvania rose to within shooting distance of Michigan to maintain its place as No. 11 on the list.

All other states produced less than 10,000,000 bbl., with Indiana and Mississippi showing substantial gains. Nebraska entered the list of producing states and showed 288,107 bbl., thus passing the "miscellaneous" states of Tennessee, Utah and Missouri.

Texas maintained its lead in the number of producing wells with 94,059, followed by Pennsylvania, Oklahoma, Kansas and Illinois. Mississippi had the highest yield per well, with a daily average for the year of 109.34 bbl. If considered on a basis of producing days, this figure would be much higher as the state entered the year with nine producers and closed it with 107. Louisiana held second place with 61.68 bbl. per well per day and California was third with 40.98 bbl. per well per day. At the other end of the list were New York, Ohio, Pennsylvania, West Virginia and "miscellaneous" with less than 1 bbl. per well per day. These states had a total of 137,820 wells, or nearly one-third of the total number of producing wells. To these stripper wells may be added over 12,000 in Illinois, 14,000 in Kansas, about 40,000 in Oklahoma and many in other states.

United States production of 1,338,237,138 bbl. in 1940 represents an increase of 82,453,604 bbl. over 1939. The greatest part of this increase came from Illinois, with Arkansas, Kansas, Louisiana, Mississippi and Wyoming also showing increases of considerable extent.

The national average daily production has increased slowly over the past few years and now stands at 9.61 bbl. per well per day or 0.37 bbl. above last year's average.

Monthly Production

The table showing monthly production contains some interesting data which throw light on probable future developments in the various oil-producing districts. Considering them in order, Arkansas, California and Colorado maintained a uniform level throughout the year. Illinois rose from 11,412,368 bbl. in January to a peak of 14,979,101 bbl. in June and then dropped off to 10,392,957 bbl. in December. This drop, incidentally, almost exactly paralleled that of the country as a whole so that other states were not benefited from Illinois' decline, except indirectly in that they did not have to take a further cut.

Indiana's rise was steady from 219,760 bbl. in January to a December peak of 632,400 bbl., due mostly to production from the Griffin pool. Michigan dropped steadily off from 20,043,668 in January to a November low of 1,273,500 but showed signs of a small comeback in December. Mississippi's rise was sudden from 107,776 in January to a September high of 805,326 bbl. At this point voluntary proration due to market conditions entered the picture and production declined to less than half that of the peak.

Oklahoma's production varied less than that of almost every other state throughout the year and finished within a small fraction of 1 per cent of where it started. In Texas, the picture was complicated by irregular shutdown periods and there was no definite trend, while Wyoming showed a summer peak of 2,516,795 bbl. or a rise from January of nearly 25 per cent. It maintained half of this rise to the end of the year.

75 Largest Fields

The 75 largest fields of 1941 include 41 which are more than 10 years old, 19 which are between 5 and 9 years old and 15 young fields, aged 5 years or less. Together they account for 58.8 per cent of the country's production as against 61.6 per cent for the same fields last year and 61.9 per cent for the 75 largest of 1939, which included 62 of this year's topnotchers. This is believed to be a healthy sign for the industry as the difference of 20,313,535 bbl. is only about one-fourth of the total increase for the United States. Expressed differently, other fields are coming along to take a greater share of the country's demand and thus to allow more economical production methods in the big ones, which used to supply

Production in the United States—1931 to 1940, Inclusive

	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	No. active wells Dec. 31, 1940	Dly. av. Prod. per well (bbl.)
Arkansas	15,626,407	12,529,870	11,449,635	11,359,458	11,138,586	10,697,345	12,181,083	18,357,235	21,364,988	25,807,707	2,906	24.26
California	188,829,032	178,127,794	173,125,420	175,508,566	207,832,131	214,756,327	238,591,887	249,930,003	224,328,365	224,014,262	14,935	40.98
Colorado	1,492,862	1,114,064	914,881	1,130,375	1,555,542	1,612,760	1,578,391	1,324,374	1,401,199	1,401,577	218	17.56
Illinois	4,717,000	4,801,000	4,252,000	4,472,000	4,351,000	4,439,000	7,426,000	22,800,000	91,797,241	146,450,876	20,227	20.09
Indiana	831,000	806,000	732,000	816,000	767,000	792,000	821,200	967,800	1,436,000	4,991,768	1,839	7.43
Kansas	38,956,338	35,339,206	41,305,768	45,754,117	53,364,446	57,084,490	69,158,432	58,134,090	59,162,680	64,944,904	20,673	8.58
Kentucky	6,490,000	6,322,000	4,621,000	4,868,000	5,324,000	5,638,000	5,496,500	5,834,300	5,622,000	5,363,671	14,495	1.01
Louisiana	22,856,536	22,467,889	25,629,655	32,478,282	50,286,626	80,807,016	90,427,302	94,955,073	94,229,472	103,522,456	6,208	61.68
Michigan	3,733,000	6,834,000	7,863,000	10,566,518	15,789,905	11,977,063	16,410,751	19,138,932	23,566,406	19,747,968	2,996	18.03
Mississippi	.....	.....	.....	.....	.....	.....	.....	.....	102,918	4,282,318	107	109.34
Montana	2,847,201	2,320,155	2,358,056	3,509,015	4,367,228	5,798,661	5,799,364	4,824,917	5,854,116	6,580,745	2,057	8.74
Nebraska	.....	.....	.....	.....	.....	.....	.....	.....	.....	288,107	32	24.60
New Mexico	15,360,383	12,344,684	13,801,278	16,438,878	20,154,321	26,647,459	38,438,072	36,008,527	37,668,235	38,756,797	3,396	31.18
New York	3,395,000	4,524,000	3,153,000	3,814,000	4,241,000	4,626,000	5,464,500	5,045,200	5,105,000	3,459,882	14,750	0.64
Ohio	5,318,000	4,606,000	4,296,000	4,299,000	4,121,000	3,837,000	3,549,900	3,297,200	3,165,000	3,116,561	28,820	0.30
Oklahoma	175,703,848	149,487,234	178,356,449	178,652,012	182,596,874	200,880,705	223,106,788	169,307,196	153,413,878	149,597,199	54,587	7.49
Pennsylvania	11,862,000	12,395,000	12,677,000	14,572,000	15,899,000	17,041,000	19,173,500	17,449,000	17,354,000	18,603,435	80,700	0.63
Texas	328,608,575	314,378,759	401,808,452	378,233,017	391,592,331	424,396,034	502,967,214	470,760,325	485,339,998	487,637,523	94,059	14.16
West Virginia	4,477,000	3,907,000	3,827,000	4,133,000	3,959,000	3,814,000	3,829,000	3,724,750	3,539,000	3,426,306	13,350	0.70
Wyoming	14,692,272	12,994,748	11,095,729	12,488,995	13,237,765	14,268,839	19,637,218	18,956,277	21,279,956	26,132,076	3,880	18.40
Miscellaneous	7,000	5,000	7,000	11,000	43,000	.....	60,000	68,200	53,082	48,000	200	0.65
Total	845,803,454	785,304,403	901,273,323	903,104,233	990,620,775	1,089,113,699	1,264,117,102	1,200,883,399	1,255,783,534	1,338,237,138	380,435	9.61
Daily av.	2,317,269	2,145,640	2,469,241	2,474,258	2,714,029	2,975,720	3,463,334	3,290,091	3,440,503	3,656,385	.....	.....

a much larger proportion. Only 13 years ago, a single county of Oklahoma, Seminole, supplied one-sixth of the country's oil. Today, even so great an accumulation as East Texas only supplies about one-tenth and the country gains from conservation measures accordingly. It is this feature which, probably more than any other, indicates the debt owed by the nation to the wildcatter who goes out and finds new production, thereby decreasing the drain on known fields.

Considering the large fields individually, there are many interesting developments. Second place is held by a lusty 3-year-old field, Salem, which will probably not remain there very long, although it is still entitled to the position, based on daily average production. Oklahoma City remains in third place with its production very slightly changed although the amount of drilling in that field is negligible. Gradual raising of allowables is responsible for its present record. The only one of the first 10 fields to show weakness in 1940 was Rodessa which has dropped nearly 30 per cent in a year and has been passed by five other fields. The first 10 fields produced 385,618,508 bbl. or nearly as much as the next 65.

Of the next 10 fields, only one showed a drop, namely the Hendrick district, which embraces practically all of the production from Winkler County. Three other oldtimers, Ventura Avenue, Huntington Beach and Santa Fe Springs, also showed a small decline which was not of great significance. Balanced against this were large increases in Centralia, a mushroom field which would now be at about the level of Chalk-Settles, based on present-day averages, Wasson, a 50,000-acre newcomer in West Texas which has barely hit its stride and is bound for higher levels; Coalinga, 40 years old, which has been rejuvenated by important discoveries; K.M.A., Gray County, and Conroe.

The twenty-first to thirtieth fields include Yates, Goldsmith-Harper and Cowden which are held down by proration, but they also include two rapidly climbing fields in Lance Creek and Magnolia. Further down on the list are several new fields which are destined for higher levels. These include Golden Meadow, which increased in a year from 694,937 bbl. to 4,009,487 bbl.; Tinsley, which jumped from 102,918 bbl. to 3,995,174, and Eola which rose from just under 1,000,000 to nearly 4,000,000 bbl. Louisiana's increasing importance is also shown by University which more than doubled its production and is nearing the 3,500,000-bbl. mark.

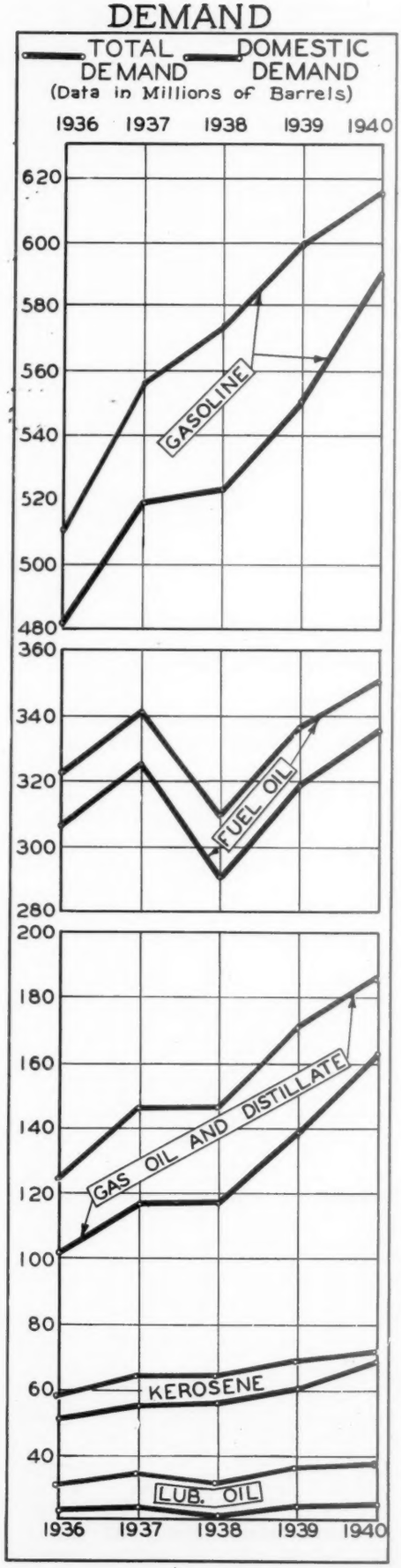
PRODUCTION—75 LARGEST FIELDS

	1940	1939
East Texas*	139,143,831	146,969,889
Salem, Ill.	70,734,313	50,179,099
Oklahoma City, Okla.*	35,970,314	35,728,192
Wilmington, Calif.†	30,203,750	31,115,616
Louden, Ill.	26,595,650	18,350,888
Midway-Sunset, Calif.*	18,400,180	18,947,029
Bradford, Pa.-N. Y.*	17,688,870	18,093,415
Kettleman Hills, Calif.*	16,720,517	19,556,609
Long Beach, Calif.*	15,995,238	16,996,027
Rodessa, La.-Ark.-Tex.†	14,165,845	20,392,187
Ventura Avenue, Calif.*	12,572,804	12,941,952
Gray County, Tex.*	12,005,623	10,918,868
K.M.A., Tex.*	11,496,885	8,207,319
Wasson, Tex.	11,063,615	4,726,803
Centralia, Ill.	10,641,870	2,265,450
Hendrick dist., Tex.*	10,276,865	12,091,483
Coalinga, Calif.*	9,934,521	5,724,621
Conroe, Tex.†	9,903,006	9,199,357
Huntington Beach, Calif.*	9,595,058	9,971,806
Santa Fe Springs, Calif.*	9,441,971	10,053,233
St. Louis, Okla.*	9,370,579	11,582,572
Lance Creek, Wyo.*	9,200,356	6,617,919
Goldsmith-Harper, Tex.†	9,156,844	9,500,847
Hutchinson County, Tex.*	8,815,777	8,463,661
Talco, Tex.†	8,720,798	9,625,038
Cowden dist., Tex.*	7,783,895	6,442,270
Dominguez, Calif.*	7,667,914	7,125,945
Yates dist., Tex.*	7,596,870	8,574,617
Magnolia, Ark.	7,402,317	3,589,627
Montebello, Calif.*	7,239,899	7,451,945
Monument, N. M.†	6,887,042	8,206,415
Smackover, Ark.*	6,628,747	6,421,056
Schuler, Ark.	6,609,747	6,193,314
Eunice, N. M.†	6,560,819	7,862,690
Fitts, Okla.†	6,246,313	9,119,925
Santa Maria Valley, Calif.*	6,162,760	6,270,023
Tomoconnor, Tex.†	5,820,819	4,260,358
Silica dist., Kans.†	5,740,305	5,182,800
Trapp dist., Kans.†	5,537,630	4,369,605
Hastings, Tex.†	5,500,282	6,516,721
Jennings, La.*	5,493,439	8,432,723
Salt Creek, Wyo.*	5,314,209	5,352,584
Saxet, Tex.*	5,252,615	8,559,514
Cotton Valley, La.*	5,161,080	4,314,947
Church-McElroy, Tex.*	5,096,031	3,702,459
Chalk-Settles, Tex.*	4,968,775	5,290,537
Vacuum, N. M.	4,737,639	3,028,381
South Ward, Tex.*	4,662,707	5,171,660
Lafitte, La.†	4,535,812	4,747,483
Freeman-Redding, Mich.	4,496,313	4,890,802
Ville Platte, La.	4,453,876	3,412,074
Elk Hills, Calif.*	4,427,359	3,833,611
Van, Tex.*	4,418,445	5,391,069
Inglewood, Calif.*	4,368,839	2,607,935
McCamey, Tex.*	4,352,840	5,258,760
Thompson, Tex.*	4,338,727	4,436,083
Walker, Mich.	4,331,041	2,695,078
Rosecrans, Calif.*	4,256,976	4,468,481
Old Ocean, Tex.†	4,150,434	3,213,257
Kern River, Calif.*	4,093,777	4,125,628
Golden Meadow, La.	4,009,487	694,937
Torrance, Calif.*	4,009,407	6,411,812
Cut Bank, Mont.†	4,003,231	3,484,515
Tinsley, Miss.	3,995,174	102,918
Eola, La.	3,878,632	965,291
Clay City, Ill.	3,866,190	6,780,813
N. Belridge, Calif.†	3,861,662	4,365,916
Cayuga, Tex.†	3,823,775	3,339,411
Hobbs, N. M.*	3,784,875	4,400,629
Earlsboro, Okla.*	3,729,866	3,589,914
Bemis-Shutts, Kans.*	3,651,655	2,887,591
Ten Section, Calif.†	3,517,421	3,245,627
Government Wells, Tex.†	3,495,287	3,322,624
University, La.	3,472,713	1,446,564
Iowa, La.*	3,448,271	4,431,018
Total	786,658,979	754,770,449
Per cent of U. S. total	58.8	61.6
Total 75 largest fields of 1939		776,345,444
Per cent of U. S. total		61.9

*Over 10 years old at end of year. †6-10 years old at end of year.

Crude Production in 1940 by Months

	January	February	March	April	May	June	July	August	September	October	November	December
Arkansas	2,161,416	2,003,179	2,147,832	2,094,366	2,221,744	2,159,555	2,257,419	2,270,736	2,215,647	2,134,037	2,074,726	2,130,050
California	18,960,399	17,642,640	18,672,342	18,403,433	19,019,257	18,523,925	19,122,398	19,256,524	18,378,003	18,938,092	18,230,804	18,866,445
Colorado	121,388	126,251	119,923	109,844	124,264	115,976	122,553	118,509	104,258	113,940	111,001	113,670
Illinois	11,412,368	11,950,146	13,517,172	13,036,152	14,095,197	14,979,104	13,600,100	11,724,786	10,729,240	10,909,092	10,104,562	10,392,957
Indiana	219,760	188,790	306,590	288,300	347,820	348,650	406,750	490,420	559,860	571,578	630,850	632,400
Kansas	5,208,651	5,034,740	5,402,163	4,708,267	4,975,365	5,162,674	5,595,196	5,632,767	5,807,904	5,890,966	5,608,705	5,918,116
Kentucky	438,280	409,509	483,487	426,844	440,510	433,912	446,803	449,050	461,457	451,747	457,366	464,706
Louisiana	8,292,694	8,024,652	8,741,458	8,802,764	9,282,037	8,706,586	8,549,627	8,574,909	8,552,403	8,578,702	8,508,994	8,907,630
N. Louisiana	*2,094,505*	*1,990,751*	*2,111,829*	*2,093,303*	*2,103,517*	*2,065,736*	*1,995,619*	*1,963,689*	*1,926,892*	*2,021,973*	*2,015,629*	*2,119,132*
Gulf Coast	*6,198,189*	*6,033,901*	*6,629,629*	*6,709,461*	*7,178,520*	*6,640,850*	*6,554,008*	*6,611,220*	*6,625,511*	*6,556,729*	*6,493,365*	*6,788,498*
Michigan	2,043,668	1,875,448	1,925,030	1,831,100	1,757,390	1,620,375	1,641,605	1,550,074	1,432,400	1,468,222	1,273,500	1,329,156
Mississippi	107,776	188,622	234,052	225,255	269,047	310,285	279,620	530,367	805,326	488,832	476,323	366,803
Montana	526,510	502,164	521,184	520,317	617,569	556,810	591,194	587,631	508,281	576,753	540,074	532,258
Nebraska	27,280	7,250	.....	.....	2,170	5,250	6,200	4,650	7,860	66,247	75,180	86,020
New Mexico	3,413,675	3,371,688	3,493,879	3,251,712	3,342,013	3,158,642	3,241,863	3,198,358	3,031,215	3,173,438	3,000,799	3,079,515
New York	309,597	304,152	322,710	306,300	302,250	297,750	284,890	266,910	265,110	274,753	256,140	269,320
Ohio	247,100	229,796	260,865	270,267	269,700	243,862	257,827	263,949	274,145	263,826	258,624	276,600
Oklahoma	12,710,217	12,132,962	12,934,936	12,494,610	12,971,206	12,158,700	12,724,038	12,493,636	11,954,090	12,424,980	11,881,670	12,716,754
Pennsylvania	1,634,475	1,576,498	1,685,687	1,665,300	1,717,710	1,502,225	1,497,735	1,528,920	1,449,120	1,425,597	1,461,990	1,458,178
Texas	42,355,358	40,058,684	46,025,456	44,365,493	43,042,427	37,852,305	38,475,489	37,208,005	39,174,034	42,014,456	38,762,635	38,204,283
North	*2,824,374*	*3,134,928*	*3,580,986*	*3,432,540*	*3,430,065*	*3,078,257*	*2,965,726*	*2,941,773*	*3,242,099*	*3,752,515*	*3,284,783*	*3,101,910*
West Central	*941,241*	*925,031*	*986,624*	*965,079*	*903,874*	*817,869*	*811,325*	*735,898*	*812,505*	*892,143*	*823,723*	*759,122*
Panhandle	*2,347,723*	*2,259,659*	*2,522,148*	*2,310,145*	*2,211,681*	*1,758,109*	*2,017,105*	*1,907,964*	*2,474,898*	*2,551,314*	*1,957,352*	*1,791,519*
West	*7,083,621*	*6,662,626*	*8,174,220*	*7,818,972*	*7,704,731*	*6,425,075*	*6,105,248*	*6,207,474*	*6,817,568*	*7,248,832*	*6,556,508*	*6,466,660*
East Central	*700,797*	*611,648*	*808,863*	*731,134*	*715,354*	*591,988*	*571,880*	*556,986*	*434,264*	*612,196*	*637,169*	*577,639*
East Texas	*12,386,445*	*11,719,359*	*12,393,616*	*12,421,746*	*11,761,458*	*10,359,803*	*12,442,722*	*11,436,638*	*10,883,881*	*11,410,725*	*10,872,871*	*11,054,567*
East Border	*1,841,603*	*1,604,521*	*1,845,003*	*1,732,798*	*1,818,961*	*1,578,823*	*1,585,109*	*1,643,135*	*1,701,656*	*1,779,545*	*1,627,961*	*1,506,116*
Upper Gulf	*7,320,046*	*6,720,210*	*7,785,307*	*7,636,298*	*7,413,995*	*6,535,420*	*5,942,270*	*5,865,783*	*6,323,145*	*7,110,129*	*7,070,328*	*7,182,859*
Lower Gulf	*4,068,320*	*3,706,236*	*4,612,862*	*4,207,924*	*3,916,959*	*3,844,951*	*3,425,475*	*3,222,312*	*3,384,888*	*3,429,725*	*3,137,247*	*3,057,190*
South Central	*653,790*	*659,247*	*707,395*	*669,952*	*697,788*	*656,200*	*619,296*	*628,043*	*590,942*	*629,035*	*602,483*	*604,132*
Southwest	*2,187,398*	*2,055,219*	*2,608,432*	*2,438,905*	*2,467,561*	*2,205,810*	*1,989,333*	*2,001,999*	*2,508,188*	*2,598,297*	*2,192,210*	*2,102,569*
West Virginia	255,905	263,523	302,250	282,120	302,566	296,250	293,260	288,610	288,360	301,878	274,140	277,450
Wyoming	2,046,023	1,857,773	2,056,225	2,022,231	2,162,421	2,113,854	2,344,470	2,516,795	2,300,261	2,196,732	2,269,371	2,245,920
Miscellaneous	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Total	112,496,540	108,231,899	119,157,243	115,108,675	117,266,657	110,550,690	113,428,457	107,073,586	108,308,974	112,267,868	106,057,454	108,272,231
Daily average	3,628,921	3,732,134	3,843,782	3,836,956	3,782,795	3,685,023	3,658,982	3,453,986	3,610,299	3,621,544	3,535,269	3,492,652



Domestic consumption higher

New Records in Demand Assured For 1941

By C. O. WILLSON

PRODUCERS and refiners of petroleum, and natural-gasoline manufacturers in the United States can look forward to an increase of approximately 80 million barrels in the demand for their products this year over 1940. Developments which cannot be forecast at this time may reduce this expected demand slightly, and other changes, largely dependent on the course of the war, may add another 50 or more million barrels to the total petroleum requirements for the year now 1 month under way.

Year-end predictions as to 1941 increase in petroleum requirements were generally higher than the 80-million-barrel figure. A recent estimate of the Bureau of Mines, which makes month-to-month forecasts of petroleum demands, indicated that 1941 petroleum needs would exceed 1940 by 8 per cent, which would mean a gain of more than 100 million barrels for the year.

The 80-million-barrel gain is predicated on a continuance of conditions and trends in the petroleum industry which got under way the latter part of 1941 when the defense program became the dominant factor in the industrial activity of this country. If the present high level of business expands to boom proportions within the next few months, or if there is a return to more normal export conditions, all estimates contained in this analysis will be too low.

The demands for 1939 and 1940 are summarized in Table 1. A brief discussion of the factors influencing consumption in 1940 will aid in estimating the probable trends this year. Before 1939 was brought to a close it was certain that the optimistic predictions heard in September 1939 as to the war needs of the belligerents in relation to petroleum exports from this country would not materialize.

Exports Decrease

Exports of most petroleum products turned downward during November and December 1939, and this decline gained momentum starting in the early part of 1940. The early decreases were brought about by the fact that the important petroleum market of Germany was shut off with the start of the war and petroleum purchases of other belligerents decreased due largely to the rationing of civilian consumption.

The German invasion of Norway, the Low Countries and France starting in April, followed by Italy's entry into the war, removed a large part of the remaining petroleum trade of Continental Europe and the entire Mediterranean area. The peacetime requirements of the invaded European countries and Italy were in excess of 300,000 bbl. daily. All these countries were important buyers of petroleum products in this country and their inability to continue their usual purchases, in large measure, accounts for the decrease of approximately 150,000 bbl. daily in exports during 1940.

1941 DEMANDS

Increases in demands for petroleum in this country this year over the record year of 1940 will total at least 80 million barrels. This large gain in requirements will materialize despite an expected reduction in exports.

Producers and refiners of crude oil in the United States will be called upon to expand their operations an average of 200,000 bbl. daily. The peak summer consumption of domestic crude oil will exceed 4 million barrels daily.

A registration of nearly 32 million motor vehicles at the start of the year and an expected increase in new-car output indicate that domestic motor-fuel requirements will total 628 million barrels, a gain of 38 million barrels over 1940.

Practically all of the domestic markets for refinery products will expand this year, the gains ranging from 5 to more than 10 per cent. Despite curtailed foreign outlets the total demands for kerosene, distillate, gas oil, residual fuel oil and lubricants will increase at least 35 million barrels this year.

A gain of 25 or more per cent is in prospect for liquefied gases. The year will bring large-scale production of rubber, explosive materials and other synthetic products from petroleum.

In estimating the 1941 export movement from this country at this time, it is assumed that European demands will not change materially. Export sales to Japan and Canada have increased in importance as those to Europe have declined. In November 1940 export shipments to Japan represented 32 per cent of the total, with average daily shipments of 90,000 bbl. The restrictions already placed on sales of aviation gasolines to Japan and the strained relations between the two governments may result in this export being lost entirely during 1941 and this possibility has been included in some analyses of this year's petroleum demands. Most estimates of 1941 demands include a small reduction in total exports compared to 1940.

Domestic

Fortunately, the projection of domestic petroleum requirements does not have the "ifs" of the foreign outlets. The pattern of 1941 so far as general business in the United States is concerned is well defined and from this it is relatively easy to determine the probable consumption of the various classes of petroleum consumers.

The consumption of motor fuels increased approximately 35 million barrels last year, one of

the largest yearly gains in the domestic industry's history. This was partially offset with a decrease of nearly 20 million barrels in exports but the total gain (domestic plus exports) established a new yearly record of 615 million barrels.

The domestic gain in gasoline is explained by a 25 per cent increase in motor-vehicle sales. These sales far exceeded the scrapping of old cars and it is estimated that registrations which totaled 30,615,087 at the start of 1940 had jumped to 31,950,000 at the close of the year. A greater percentage of trucks and other large consumers of gasoline and the favorable business conditions brought further increases in the consumption per motor vehicle.

With approximately 1,300,000 more motor vehicles on the streets and highways at the start of this year than was the case a year ago, and a prediction on the part of car manufacturers that their output this year will exceed that of 1940, it is easy to become optimistic regarding the consumption of motor fuels in the United States through 1941. Orders already placed, including tens of thousands for the various phases of the defense program, assure a record output of trucks and other commercial vehicles whose per-unit consumption of motor fuel is 5 to 20 per cent greater than the average family car. The large increase in airplane output will also be a more important factor in increased gasoline consumption than it has been in the past.

Recent announcements have indicated that car output this year might be less than the year-end schedules because part of the plant facilities of several manufacturers will be required for the production of essential defense equipment and supplies. Earlier, the manufacturers said this work would not interfere with their car production. It is too early to evaluate this possible development in its relation to gasoline consumption.

It is estimated that domestic gasoline consumption this year will total 628 million barrels, an increase of more than 6 per cent over 1940. Exports are estimated at 26,200,000 bbl., making a total of 654,200,000 bbl. for the year.

Other Products

In regard to the consumption of products other than gasoline, there are no consumer data comparable to those available in the case of motor fuels on which to project demands for kerosene, distillate, gas oil, fuel oil, lubricants and other products. The percentage gains for kerosene, gas oil, and distillate in recent years generally have been greater than those of gasoline. Oil-burner installations, which showed a large increase in 1939, continued to expand in 1940 and the prospects for 1941 are favorable, according to trade authorities in that field. Diesel-fuel outlets are rapidly expanding and a record sale of new engines—with many defense uses—is assured for this year.

Kerosene

Kerosene has suffered in recent months due to an exceptionally large decrease in exports. The European markets that have been cut off from world trade were large consumers of American kerosene. With no certainty that this situation will change, any estimate of 1941 kerosene requirements has to include a further drop in export kerosene shipments. At this time the total demand for kerosene this year is placed at 76,500,000 bbl., which includes a 1,000,000-bbl. drop in exports and an increase of 6,000,000 bbl. in domestic demand.

Distillate and Fuel Oil

An increase of 20,000,000 bbl. in domestic gas oil and distillate consumption appears conservative with a decline of 4,000,000 bbl. in exports. Recent reports indicate that later in the year the export demand for these products may recover, in part, from the 1940 declines.

General business conditions are a reliable barometer of consumption trends in residual fuel oils, the principal demand for which comes from industries, public utilities, railroads, marine trade and the heating of large buildings. The demand has been heavy in recent months and large contract orders covering all or part of 1941 have been placed by major consumers. An increase in domestic demand of at least 20,000,000 bbl. appears assured this year with little change in exports compared to last year.

Lubricants

Lubricants over the past year suffered less than other products in regard to export shipments but the increase in domestic sales was also less than the average. Prospects for industrial sales this year are highly favorable and the lubricating-oil manufacturers will also benefit in motor-oil sales from the developments which assure a widened market for gasoline. Those connected with this phase of refinery operations expect an export demand at least as large as that of last year with an increase of 1,500,000 to 2,000,000 bbl. in domestic business.

The outlook for the byproduct operations of the petroleum industry was never more satisfactory than it is at this time. The year will bring large-scale production of synthetic-rubber materials and the base chemical for the manufacture of explosives. Important outlets in the plastic fields are being developed.

Supply

At this time it appears certain that this year's expansion in demands will be largely supplied through the increased output of domestic producers and refiners. The following table shows the sources of supply in this country in percentages:

	1939	1940	Nov. 1940
Domestic crude-oil output	91.8	90.7	89.9
Natural gasoline	3.7	3.6	4.0
Benzol	.2	.2	.2
Imports (crude and refined products)	4.3	5.5	5.9

The principal trend shown in this table is the increasing importance of imports over the past year. Imports of crude-oil and refinery products last year averaged approximately 225,000 bbl. daily, an increase of 63,000 bbl. daily, or 30 per cent over 1939. These imports, however, as shown in the table still represent less than 6 per cent of the total petroleum supply in the United States.

There has been little change in import trends in recent months and at this time there are no indications that these in shipments from foreign countries will be greatly increased this year. Under the favored-nation treaties imports ranging up to 5 per cent of the domestic refinery operations can be brought into this country with reductions of 50 per cent in duties. Any large increases over present levels would necessitate the payment of the full duty of 21 cents per barrel on crude oil and fuel oils and higher rates on the lighter refined products. This situation will tend to restrict further expansion in imports this year. While the trend in production has been upward in both natural gasoline and benzol, these products represent such a small part of the whole that any changes in 1941 output will be of minor importance.

In analyzing 1941 supply and demand many have advocated that part of the supply should come from reduced inventories. Stocks of all oils increased more than 40 million barrels last year and it is contended that 1941 operations should be balanced to bring about a reduction in stocks ranging from 10 to 30 million barrels. While this plan can be supported in statistical studies it is improbable that total stocks of the industry will be reduced more than a few million barrels this year. The increased demands this year and the special requirements of the defense program will cause many operators to feel that their minimum working inventories should be increased rather than decreased.

These several situations lead to the conclusion that domestic producers and refiners of crude oil will be called upon from month to month to supply practically all of the increased demands. This will mean an average daily expansion in crude-oil production and refinery crude runs to stills of approximately 200,000 bbl. daily. Provided producers restrict their operations to seasonal requirements over the next few months, the summer peak in consumption will bring a demand for domestic crude in excess of 4,000,000 bbl. daily.

In regard to 1941 operations, economists of the industry are strongly urging the continuance of crude-producing and refinery operations at approximately present levels through the first quarter. They point out that last year there was a rapid expansion in operations during the early months with the year's peak crude-oil output of nearly 3,900,000 bbl. daily being reached in late March. This production exceeded demand at that time and stocks were accumulated. In the refinery division the crude runs to stills were excessive and inventories far in excess of working requirements were accumulated. These developments were reflected in marketing conditions and the industry spent the rest of the year making adjustments for early production excesses.

In connection with this demand analysis attention is called to the Bureau of Mines report on Page 168 which summarizes petroleum supply and demand by products for the first 11 months of 1940 compared with the same period in 1939.

TABLE 1—PETROLEUM DEMAND 1939-1940

(Data in barrels)

	1939	1940*	1940 increase per cent
ALL OILS			
Domestic demand	1,231,076,000	1,320,423,000	7.2
Exports	183,959,000	132,272,000	—30.0
Total demand	1,420,035,000	1,452,695,000	2.3
Crude runs to stills	1,237,840,000	1,290,000,000	4.6
PRODUCTS			
Motor fuel:			
Domestic	555,509,000	590,000,000	6.2
Exports	44,638,000	25,000,000	—44.0
Total	600,147,000	615,000,000	2.4
Kerosene:			
Domestic	60,503,000	68,300,000	12.9
Exports	8,241,000	3,500,000	—57.5
Total	68,744,000	71,800,000	4.4
Gas oil and distillate fuel:			
Domestic	138,723,000	163,000,000	17.5
Exports	32,020,000	23,300,000	—27.2
Total	170,743,000	186,300,000	9.1
Residual fuel oils:			
Domestic	319,738,000	335,000,000	4.8
Exports	17,483,000	16,400,000	—6.2
Total	337,223,000	351,400,000	4.2
Lubricants:			
Domestic	23,713,000	24,600,000	3.7
Exports	11,881,000	11,169,000	—6.0
Total	35,594,000	35,769,000	0.005
Wax (lb.):			
Domestic	325,461,000	375,900,000	15.5
Exports	232,864,000	193,000,000	—17.0
Total	558,125,000	568,900,000	1.9

*December estimated.

Court Rulings in Oil Cases Highlights of Washington Review

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 27.—Federal regulation of the oil industry advanced several steps during 1940, and the trend was accelerated rather than slowed by the national-defense program.

Little legislation directly affecting the industry was enacted by Congress during the year, but pressure for new laws increased and the ground work was laid for several measures destined to be revived by the Seventy-seventh Congress.

The biggest step toward federal regulation was the sweeping antitrust suit against the American Petroleum Institute and 22 major oil companies filed by the Department of Justice in the federal district court in the District of Columbia in September. One of the largest antitrust suits ever filed, it charges the majors with a long series of concerted acts alleged to result in fixed prices and the elimination of competition, and virtually asks that the majors be dissolved into small unintegrated units. The litigation thus started was destined to run for several years and whatever its final outcome it is expected to have a profound effect on the future structure of the oil industry.

Thus 1940 brought to a head long-festering complaints against the industry, complaints which have echoed in legislative halls, courtrooms and public prints. The A.P.I. suit also demonstrated a new technique in federal regulation developed by Asst. Atty. Gen. Thurman Arnold, an attempt to use an injunction or a consent decree under the antitrust laws as an instrument for reforming and rearranging the organization, trade practices and business methods of an entire industry and to make it conform to a pattern drawn by the Department of Justice.

The filing of this suit was preceded by a controversy within the administration over government policy during the defense emergency. The newly formed National Defense Advisory Commission asked to review the suit before it was filed and made a report which strongly suggested that many of the objectives of the Department of Justice would interfere with the ability of the oil industry to function efficiently for purposes of national defense. But the suit was filed anyway, modified only to the extent of dropping certain prayers for specific methods of disintegrating the major companies.

Pipe-Line Suits

At the same time the Department of Justice filed suits against three oil-pipe-line companies charging them with violating the Elkins Transportation Act by giving "rebates" to shippers through the device of paying dividends to their owners whose oil they shipped almost exclusively. These suits were admittedly test cases and the first step in an attempt to force divorcement of pipe lines from ownership by major companies.

Congressional agitation for divorcement legislation was not quieted by these suits, but the only action during 1940 on bills to divorce marketing, transportation and refining was a minor move in the House where jurisdiction over such legislation was taken from the judiciary committee, which had held hearings, and given to the committee on interstate and foreign commerce which was engaged in a general investigation of the oil industry under direction of a House resolution.

The year also saw the end of 4 years of litigation in the Madison oil case in which 23 companies in the Midwest had been charged with an illegal price-fixing scheme through operation of a tank-car gasoline-buying pool. The Supreme Court's decision on May 6 upheld the Government on every point appealed and was a milestone in antitrust enforcement since it virtually eliminated the "rule of reason" and held that any restraint of trade is illegal even though done with the purpose of benefiting the industry as a whole and even though not resulting in injury to consumers or competitors. Government attorneys hailed the decision not only as vindicating their position during the trial but also as greatly strengthening the antimonopoly drive.

Cole Bill

The most important legislative proposal pending in Congress during 1940 was the Cole bill for federal regulation of oil production and conservation practices. The measure had been introduced the previous year at the request of President Roosevelt and the Interior Department and was still pending in the same form when the year closed but with every prospect that some action would be taken soon thereafter. The House subcommittee charged with considering this bill and other aspects of the oil industry, headed by Rep. William P. Cole, Jr., of Maryland, held hearings early in the year in California and held extensive hearings in Washington during most of February at which spokesmen for the oil industry and the governors of oil-producing states were unanimous in the assertion that state control of conservation is adequate and federal control is not necessary to prevent the waste of oil. In April President Roosevelt suggested a "compromise" under which federal standards would be set for oil conservation which would be enforced by the federal Government only where state governments failed to apply and enforce them. Aside from printing the record of the hearings, nothing more was done about the Cole bill until December, when the president again urged action because of the need of conserving oil for national defense. A hearing was scheduled to obtain the views of spokesmen for the Defense Commission but was later postponed until the new year. On the last day of the old session the House granted the Cole committee an extension to April 1941 so the anticipated report on the measure was not submitted.

Much excitement over possible plans for federal control of the oil industry was occasioned by a series of secret meetings which Secretary Ickes held with four oil men invited to Washington by him in September. There was no revelation during the year as to what happened at these conferences, but the presumption was that the secretary had in mind some proposals for having federal officials sit in on industry-wide conferences to discuss current problems confronting the industry.

The national-defense program which dominated the government scene during most of 1940 affected the oil industry in many ways. Specifically, plans were laid for construction of plants to produce toluene from petroleum to meet the expanding needs for explosives, and a program was mapped out, though not put into effect by the close of the year, for purchasing and storing large quantities of 100-octane aviation gasoline against the day when our expanded fleet of military aircraft might require more fuel than could be produced by existing facilities.

One important defense measure was the export-license-control act, passed to prevent exportation of articles needed for the defense program. Under the authority of this act the administration prohibited the exportation, except under special license, of a long list of commodities, including aviation gasoline and lubricating oil, and equipment and plans for making these products.

Foreign Affairs

In the field of foreign affairs, the Government permitted to expire without attempts at renewal the commercial treaty with Japan; this made it possible for the Government to take any steps desired to cut off trade with that country, including a very large trade in petroleum products, but nothing definite was done in this direction other than actions under the Export License Act. Without much debate Congress extended for another 3 years the power of the administration to negotiate reciprocal-trade agreements with other countries involving reductions in tariff duties and import taxes, in spite of opposition from domestic petroleum producers who complained that the Venezuelan trade agreement bound Congress against increasing oil-import taxes and opened the way to unlimited imports in the future. Imports of oil from expropriated properties in Mexico received some discussion in Congress and a bill was considered but not passed to amend the stolen-property act to prevent such imports.

Tanker rates between the Gulf and North Atlantic ports were investigated by the House merchant-marine committee on complaints of high prices for fuel oil in New England, but no action was taken.

Labor legislation was debated heavily throughout the entire year of the Congress session, but no action resulted. Pressure to relax the wage-and-hour law was relieved when the administrator of that act altered the regulations in many respects, particularly as to keeping detailed records and exempting many classes of "white-collar" workers under the headings of administrative, executive, and professional employes. A House committee spent months investigating the conduct of the National Labor Relations Board but was unable to agree on amendments to the Wagner Act. Meanwhile the president made a change in the chairmanship of the board and several N.L.R.B. staff members who had been severely criticized resigned and the staff was reorganized.

The Temporary National Economic Committee, which was scheduled to recommend legislation for federal regulation of the oil and other industries during 1940, did not complete its work and was given an extension of life.

Industry's Defense Position Bolstered During Past Year

The last official report shows that the petroleum purchases of the military units of the United States—Army, Navy, and Coast Guard—in 1938 totaled 12,873,733 bbl., or 35,250 bbl. daily. This total was divided: 83 per cent fuel oil, 12 per cent gasoline, and the remaining 5 per cent, diesel oil and lubricating oils.

These purchases for 1938 represented less than 1 per cent of the total supply available in the United States that year.

Petroleum purchases of the military branches were expanded slightly in 1939 with further increases in 1940. This year, with all phases of the defense program under way and more than a million men in service by midsummer, petroleum requirements will expand rapidly.

In this article the preparedness position of the petroleum industry of this country to supply these military requirements is summarized based on the information reviewed in this Annual Statistical Number, bringing the information to January 1, 1941.

The principal situation revealed in this analysis is that military requirements, should they expand several times over the peacetime level of 1938, would still represent a small fraction of the total supplies available in the United States.

THE ability to keep production ahead of consumption of petroleum is dependent on the drillers who last year drilled over 91,000,000 ft. (approximately 17,000 miles) of hole. A total of 30,040 wells was drilled. This work was done by approximately 8,500 drilling rigs of all types. Recent advances in drilling technique, particularly the increased rate of penetration, makes it possible to drill more wells annually than ever before.

In case of national emergency, the rate of drilling could be easily expanded 25 per cent. Prior to 1932, these rigs were operated by men working in 12-hour shifts, but they now operate with three or four shifts working 8 or 6 hours per day. By going back to the longer hours during an emergency, the 150,000 men engaged in actual rig operation could easily take care of any required drilling increase.

Production

Crude-oil production in 1940 was increased by 6.6 per cent to an all-time high of 1,338,237,138 bbl. Production from our largest fields represented a smaller amount of this total than in 1939, indicating that other flush fields are coming along to take their place even before they are needed. It has been estimated that five areas, namely the Gulf Coast, California, East Texas, West Texas and Kansas, could step up production to the extent of a million barrels daily overnight without the drilling of a single additional well and without damaging the fields by producing at faster than the optimum rate. This represents an immediately available increase of 27.5 per cent in our daily production. Of the five areas, three are a considerable distance from our shores, and even in the case of California, most of the available increase is in the San Joaquin Valley, separated from the coast by an easily defended mountainous area.

Reserves

Today we have in sight an estimated reserve of 20,099,258,000 bbl., or almost exactly 15 years' supply at the present rate of consumption. This oil could not be raised in 15 years. Some of it, in fact, will be brought to the surface 50 years from now. It is also probable that the reserve in existing fields will prove greater than we now estimate it. Production technique keeps adding to recoverable oil from proven fields, and in spite of our 80-year history, no major pool has yet been abandoned.

We have 15 years' supply today mainly because it is not economical to develop more. Any mining engineer knows that the present worth of ore to be produced more than 15 years from now is less than the cost of development. The same is true of oil, especially under proration. In this connection, great concern was expressed when we only had 6 years' supply in sight. Yet with production up 275 per cent from 1918 we have increased our volume of oil in reserve 1½ times as fast as we have increased our rate of production. There is no indication that we have yet seen the crest of available reserves.

Refineries

There are 453 operating refineries in the United States located in 36 states and more than 300 towns and cities. These plants have a daily crude-oil capacity of 4,433,678 bbl. daily, which exceeds by 900,000 bbl. daily the average crude-oil runs to stills in 1940. The peak runs to stills last year were under 3,700,000 bbl. daily, and it is not expected that this year's runs at any time will exceed 3,900,000 bbl. These figures on capacity do not include 53 refineries—mostly small local plants—with a capacity of 203,190 bbl. daily which are shut down at this time.

The capacity of the operating plants if the necessity arose could be increased over present ratings 10 to 20 per cent within a period of 6 months to a year. There is also wide flexibility in the modern refinery in regard to method of operations enabling refiners to greatly increase yields of certain products. Ordinarily, market conditions determine the method of operation, but this normal control could be modified to meet emergency demands for needed defense products.

The production of the principal products last year was: Motor fuel, 629,000,000 bbl.; kerosene, 74,000,000 bbl.; distillate and gas oil, 182,775,000 bbl.; residual fuel oil, 315,545,000 bbl.; lubricating oils, 37,665,000 bbl.; wax, 520,000,000 lb.; asphalt, 5,350,500 tons; road oil, 7,711,000 bbl. The production of all these products can readily be expanded to meet the expected increases this year.

In addition to the refineries, the industry has 620 natural-gasoline plants scattered throughout the oil fields of the United States with a production at this time of 150,000 bbl. daily. Some of these plants make a finished motor fuel but the bulk of the product is blended with the refinery gasoline products.

These refineries and natural-gasoline plants now produce more than 300 million gallons of liquefied gases yearly. These gases, consisting principally of propane and butane, are consumed as fuels in homes and other buildings and also have a wide use in several industries. This year increased quantities will be supplied to industries which will be engaged in defense activities.

Refinery gases this year will also be the source of supply for the large-scale production of synthetic rubber and chemicals used in the manufacture of explosives. Refiners can make available an almost unlimited supply of the hydrocarbons that go into the production of these products and the output can be expanded to meet the requirements of the defense program and other outlets.

The present production of aviation gasoline far exceeds the requirements of aviation engines now in use. New engines are being designed to use 100-octane motor fuel and the output of plants now operating and those projected for 1941 assure an adequate output of this high-octane fuel.

Transportation

The petroleum industry closed the year with 120,000 miles of crude-oil pipe lines, about equally divided between trunk lines and gathering lines. The gathering systems connect to practically every well in the producing states and the trunk-line systems traverse a vast interior area including the southwestern, middle western and several states of the eastern part of the United States. California has an intrastate system which connects fields to refineries and terminals located in that state.

The industry as of the first of the year also had more than 8,000 miles of gasoline lines connecting refineries and terminals to large consuming centers located in several states east of the Rocky Mountain areas. Additional lines are planned for this year.

Marketing

Qualifications of the industry to serve the defense requirements extend to the phase of distributing products to whatever points the military service organizations specify. There are approximately 410,000 service stations sprinkled through every city, hamlet and settlement of the country but in general the distribution is in ratio to population. Pipe lines are augmented in the work of distributing petroleum by 135,000 tank cars which have a total capacity of 32,400,000 bbl. and 140,000 trucks, 40,000 of which are tank trucks.

The nation's oil today comes from 380,435 wells scattered among 23 states. Four of the seven largest producing states are Oklahoma, Illinois, Kansas and New Mexico. Even farther inland, Wyoming has important reserves of oil for which there is, at present, insufficient demand and reserves totaling over 150,000,000 bbl. are proven but have not been completely drilled up because of lack of markets.

As prospecting enters new territory, the chances of success are increased by the use of newer methods of prospecting. The fact that methods formerly used resulted in a flock of dry holes is of no real significance. Still older methods and ideas also condemned West Texas, western Kansas and even such prolific fields as Oklahoma City.

World Production Sets Record Despite Reduction Outside U.S.

By H. STANLEY NORMAN

A decline of more than 44,000,000 bbl. in the crude-oil production of other countries in 1940 was more than offset by the increase in the United States. Aggregate world oil production reached a new peak of 2,136,566,088 bbl.

RECORD crude production from the United States in 1940 offset a net decline of 5 per cent in the aggregate yield of all other oil countries in the world and pushed the grand total to a new peak of 5,837,613 bbl. daily.

Crude production estimated at 2,136,566,088 bbl. last year was the largest ever registered by the world oil industry and 1940 became the third year in history in which the 2-billion-barrel mark was exceeded.

Production outside the United States totaled 798,328,950 bbl. in 1940, a decline of 44,555,030 bbl., or approximately 5 per cent less than in the preceding year. Retrogression of production outside the United States can be charged exclusively to the European war. Declines by countries generally varied in direct ratio to their respective relationships with the markets of Europe, Scandinavia and the Mediterranean.

Venezuela is the chief oil-trade victim of the European war despite its location 4,000 miles from the zone of combat. In recent pre-war years, Venezuela has been one of the main sources of oil supply for western, northern and southern Europe. Consequently, the dislocation of European consumption created intense reaction in Venezuela, the largest producing country in Latin America and the third largest in the world.

The Venezuela decline of 61,858 bbl. in daily average was diametrically counter to the potentialities of the nation's oil industry. Three new fields in the eastern part of Venezuela reached commercial status in 1940 and other discoveries were made that, under normal conditions, would have warranted more intensive development. The blockade of European markets worked a special hardship against heavy-type crude from the Lake Maracaibo basin district of western Venezuela. Consumption of bunker fuel by the British Navy fell far short of offsetting the war restrictions on normal marine demand.

There are 25 nations, or possessions, in the world, each producing in excess of 275 bbl. of oil daily but nearly 93 per cent is concentrated in seven countries. Last year the United States produced 62.7 per cent of the world total, compared to 60.2 per cent in 1939. There were no other significant changes. Rumania and Mexico are equal now in volume of production. The Rumanian decline has been spread over 4 years and the 1940 drop loses significance because gradations have been uniform. The three leading producers of the world combined account for nearly 82 per cent of all crude-oil recovery.

The increase of 215,884 bbl. in daily production from the United States boosted domestic-crude output to a record of 1,338,237,148 bbl. for the year. The gain in United States production coupled with that of 21,604 bbl. daily in the U.S.S.R. more than compensated for reductions in 10 countries out of the 25 listed nations.

Iraq, second largest producing country in the Near East and completely dependent on the Mediterranean for oil exportation, suffered a decrease of 16,815 bbl. in daily-average yield,

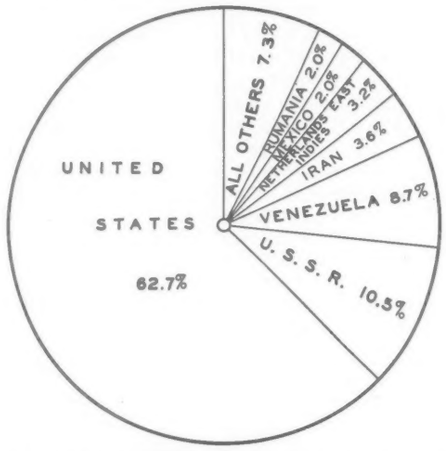
Intimate relationship of Iraq production and French imports explains the decline. Current conditions are less favorable than indicated by the annual production figure of 24,720,000 bbl. for Iraq. After France sued for peace, the northern leg of the Iraq pipe line terminating at Tripoli, a French port, was retired from service. In June, when Italy entered the war, western movement of oil through the Mediterranean was halted for most all peaceful purposes. Production and deliveries from Iraq and other Near East producing countries were maintained at approximately normal levels until the German drive through the Low Countries started in May. Estimates are that Iraq production was not more than 25,000 bbl. daily at the end of the year. France consumed about 55,000,000 bbl. annually in recent prewar years.

A decline of 8,921 bbl. in daily-average production of Rumania is indicated for the year on the basis of figures that do not yet reflect what damage, if any, was suffered by fields from the November earthquakes. Restrictions imposed on Mediterranean exports and finally the complete Nazi circumvention of Rumania's oil industry stifled normal operations during the middle 6 months of the year. Intensive work has been under way in the past 60 days to increase the supply of Rumanian petroleum available to Germany.

The increase of 21,604 bbl. in daily average production from the U.S.S.R. is without particular significance from a world supply standpoint. The Soviets are consuming within a few thousand barrels of their internal production. The increase of 3 per cent in 1940 production still leaves the union 10 to 15 per cent below the year's projected goal. Iran's production was down slightly but direct interest of the government in the yield from that country through a 50 per cent stock ownership in Anglo-Iranian Oil Co., Ltd., influenced maximum utility of the reserves there.

The war-inspired necessity of conserving United States cur-

(Continued on Page 228)



Nearly 93 per cent of the world's crude oil is produced by seven countries in this charted relationship

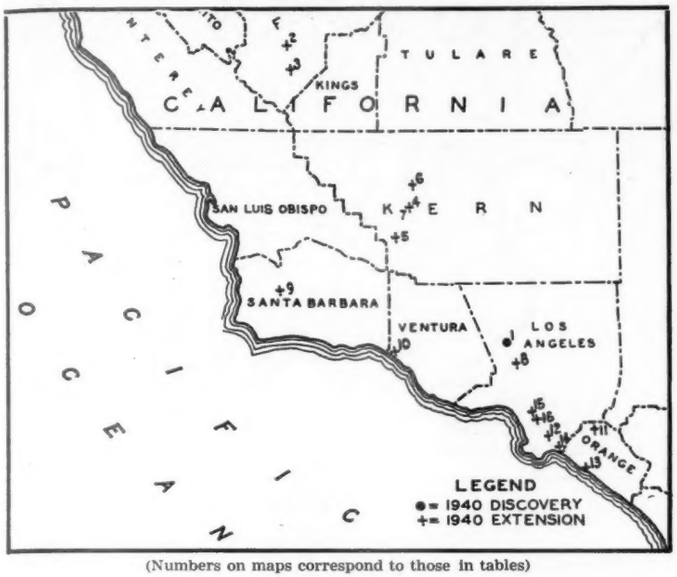
ESTIMATED WORLD CRUDE-OIL PRODUCTION

	Total		Daily averages		Change
	1940	1939	1940	1939	in 1940
United States	1,338,237,138	1,255,783,540	3,656,385	3,440,503	+215,882
U.S.S.R. (incl. Sakhalin)	225,000,000	216,500,000	614,755	593,151	+21,604
Venezuela	186,000,000	208,070,000	508,197	570,055	—61,858
Iran (Persia)	76,290,000	77,030,000	208,443	211,041	—2,598
Netherlands East Indies*	68,700,000	68,684,000	187,705	188,175	—470
Mexico	42,840,000	42,897,500	117,049	117,527	—478
Rumania	42,500,000	45,640,100	116,120	125,041	—8,921
Colombia	25,180,000	23,774,150	68,798	65,135	+3,663
Iraq	24,720,000	30,790,000	67,541	84,356	—16,815
Argentina	20,640,000	18,614,660	56,393	50,999	+5,394
Trinidad	20,300,000	19,270,000	55,465	52,794	+2,671
Peru	12,342,500	13,496,880	33,721	36,978	—3,251
Canada	8,550,000	7,743,320	23,362	21,215	+2,147
Germany†	8,000,000	7,500,000	21,858	20,548	+1,310
Burma	7,750,000	7,396,000	21,175	20,263	+912
Bahrein Island	7,200,000	7,588,560	19,672	20,791	—1,119
Egypt	6,618,000	4,415,000	18,082	12,096	+5,986
Saudi Arabia	4,770,000	3,933,900	13,033	10,778	+2,255
Japan (incl. Taiwan)	2,700,000	2,654,000	7,377	7,271	+106
Ecuador	2,475,000	2,354,370	6,762	6,450	+312
British India	2,150,000	2,164,000	5,874	5,929	—55
Hungary	1,975,000	1,055,000	5,396	2,890	+2,506
Italy (incl. Albania)	1,350,000	1,025,000	3,688	2,808	+880
Cuba	114,000	107,540	311	295	+16
Bolivia	101,090	115,000	276	315	—39
Others	63,450	65,000	173	178	—5
Total	2,136,566,088	2,066,867,520	5,837,611	5,667,582	+170,029

*Includes Sarawak and Brunei. †Includes Poland, Austria, Slovakia, and Moravia.

PROVEN RESERVES

(Continued from Page 37)



(Numbers on maps correspond to those in tables)

CALIFORNIA

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
Discovery			
(1) Del Valle, Los Angeles; Modelo	160	225	10,000,000
Extensions			
(2) Coalinga, Northeast, Fresno; Gatchell zone	1,150	250	30,000,000
(3) Coalinga, Southeast, Fresno; Gatchell zone	2,250	400	150,000,000
(4) Coles Levee, Kern; Stevens zone	1,000	150	10,000,000
(5) Midway-Sunset, Kern; Republic zone	160	50	1,000,000
(6) Rio Bravo, Kern; Rio Bravo and Vedder	1,800	300	15,000,000
(7) Tupman, Kern; Stevens zone	2,000	350	50,000,000
Total San Joaquin Valley			256,000,000
(8) Aliso Canyon, Los Angeles; Porter zone	640	400	5,000,000
(9) Los Flores, Santa Barbara	640	200	5,000,000
(10) Rincon, Ventura; Miley zone	600	250	5,000,000
Total coastal district			15,000,000
(11) Coyote, East, Orange County; Stern zone	300	200	5,000,000
(12) Dominguez, Los Angeles; Callender zone	100	175	10,000,000
(13) Huntington Beach, Orange; Ashton zone	200	250	15,000,000
(14) Long Beach, Los Angeles, De Soto zone	160	200	15,000,000
(15) Inglewood, Los Angeles, Sentous zone	80	150	2,500,000
(16) Potrero, Los Angeles; Cypress	160	50	5,000,000
Total Los Angeles Basin			52,500,000

COLORADO

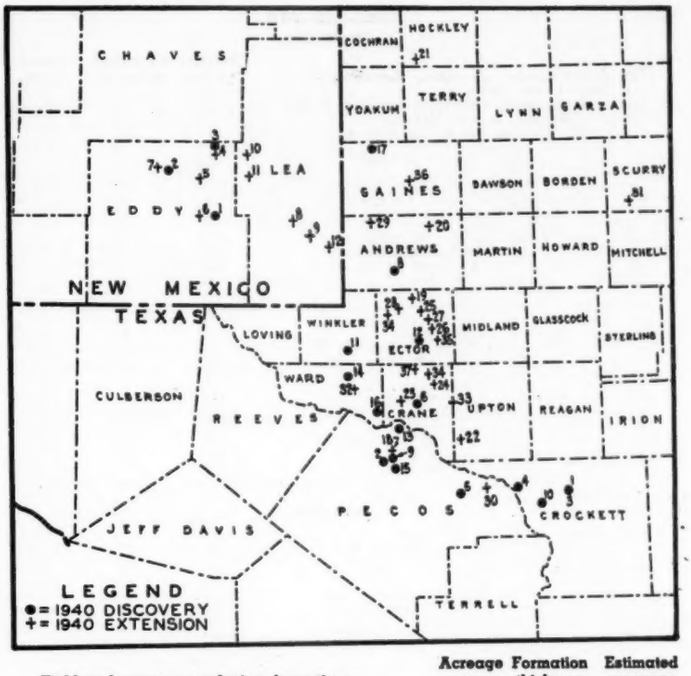
Extension			
(1) Wilson Creek, Rio Blanco; Morrison sand	240	35	2,400,000

WYOMING

Discoveries			
(1) Cole Creek, Natrona; Shannon sand	820	30	8,200,000
(2) West Ferris, Carbon; Tensleep	40	21	120,000
(3) North La Barge, Sublette; Wasatch	80	38	400,000
(4) Lost Soldier, Sweetwater; Tensleep	120	185-361	1,200,000
(5) Mahoney, Carbon; Tensleep	40	19	200,000
Total			10,120,000
Extensions			
(6) Lance Creek, Niobrara; Sundance	160	40	2,400,000
(7) La Barge, Sublette; Wasatch	80	38	400,000
(8) Rock River, Carbon; Sundance	40	47	600,000
(9) Frannie, Park; Embar-Tensleep	240	...	1,200,000
(10) Wertz, Carbon; Tensleep	80	...	2,000,000
Total			6,600,000

PERMIAN BASIN

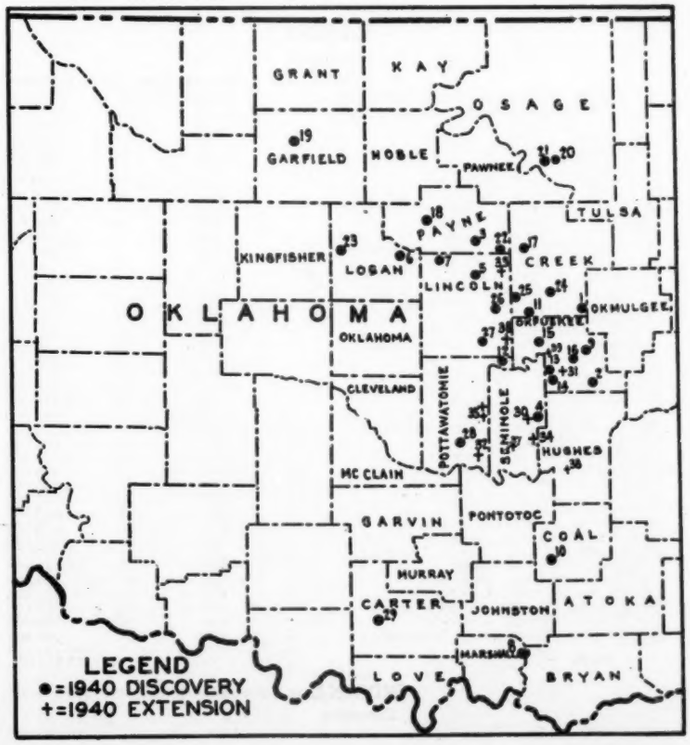
Discoveries			
(1) Wyatt, Crockett; upper Permian lime	40	5	32,000
(2) Olson-McCandless, Crockett; Ellenburger	40	39	400,000
(3) Todd Deep, Crockett; Strawn	640	100	6,400,000
(4) Noelke, Crockett; Yates sand	80	30	320,000
(5) Walker, Pecos; upper Permian	640	25	640,000
(6) Sand Hills extension, Crane; Ellenburger	100	23	1,000,000
(7) Funk, Tom Green; Blaine (Permian)	20	18	16,000
(8) Atlantic-University, Andrews; Big lime	1,200	125	7,200,000
(9) Moore-Olson, Crockett; upper Permian	20	211	20,000
(10) Hoover, Crockett; upper Permian	20	133	16,000
(11) South Halley, Winkler; Big lime	160	241	1,280,000
(12) Duro, Ector; Big lime	40	132	240,000
(13) Abell, Pecos; Simpson	60	87	600,000
(14) South Magnolia-Sealy, Ward; Permian	800	28	4,000,000
(15) O'Neil, Pecos; upper Permian	20	28	50,000
(16) Shipley Deep, Ward; Silurian	40	42	400,000
(17) Wasson Deep, Gaines; lower Permian	40	684	320,000
Total			22,934,000
Extensions			
(18) Apco, Pecos; Ellenburger	480	40	4,800,000
(19) North Cowden Deep, Ector; Holt lime	1,000	56	8,000,000
(20) Means, Andrews; Big lime	400	20	2,600,000
(21) Slaughter-Duggan-Dean (now combined), Hockley; Terry and Cochran	32,500	90	195,000,000
(22) McCamey, Crane-Upton; Big lime	100	30	700,000
(23) Sand Hills Ord., Crane; Ellenburger	100	45	1,000,000
(24) Waddell, Crane; Big lime	3,000	40	24,000,000
(25) North Cowden, Ector; Big lime	1,000	56	8,500,000
(26) Foster, Ector; Big lime	600	35	4,200,000
(27) Johnson, Ector; Big lime	5,000	28	20,000,000



Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(28) Goldsmith, Ector; Big lime	600	70	6,600,000
(29) Wasson, Gaines-Yoakum; Big lime	2,500	80	20,000,000
(30) White & Baker, Pecos; Big lime	80	15	80,000
(31) Sharon, Scurry; Permian lime	1,400	30	2,800,000
(32) Estes, Ward; Estes sand	200	15	1,400,000
(33) McElroy, Crane-Upton; Big lime	600	75	9,000,000
(34) McKnight, Crane; Big lime	800	46	6,400,000
(35) Addis, Ector; Big lime	1,000	40	4,000,000
(36) Seminole, Gaines; Big lime	3,000	60	21,000,000
(37) Jordan, Crane-Ector; Big lime	200	40	1,400,000
Total			341,480,000

SOUTHEAST NEW MEXICO

Discoveries			
(1) Keyes, Eddy; Permian sand	80	13	240,000
(2) Dayton, Eddy; Permian sand	640	10	1,920,000
(3) Thomas-Bowers, Eddy; Permian lime	40	...	80,000
Total			2,240,000
Extensions			
(4) High Lonesome, Eddy; Permian lime	2,500	20	8,750,000
(5) Loco Hills, Eddy; Permian sand	3,000	14	12,000,000
(6) Willis, Eddy; Permian sand	400	10	1,000,000
(7) Artesia, Eddy; San Andres lime (Permian)	500	20	1,750,000
(8) West Eunice, Lea; Permian lime	200	30	1,600,000
(9) South Eunice, Lea, Permian lime	600	45	4,800,000
(10) North Maljamar, Lea; Permian lime	150	24	600,000
(11) South Maljamar; Permian sand	200	15	800,000
(12) Skelly, Lea; Permian sand	350	27	1,400,000
Total			32,700,000



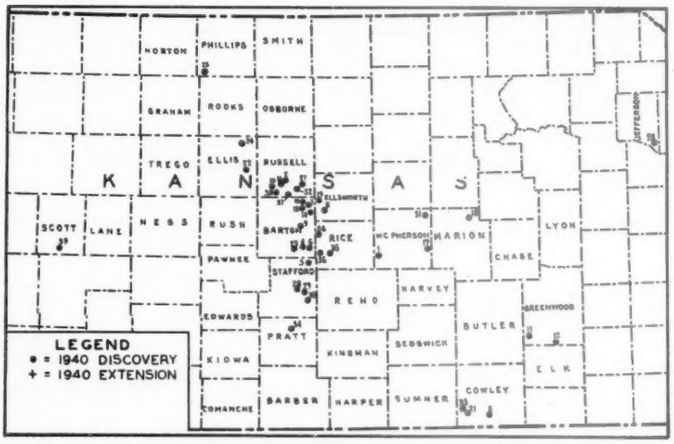
OKLAHOMA

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Edna, Creek; Wilcox	240	18	720,000
(2) West Weleetka, Okfuskee; Booch	320	16	960,000
(3) East Broyles, Payne; Oswego	240	50	580,000
(4) North Wewoka, Seminole; Wilcox	160	24	720,000
(5) Kendrick, Lincoln; Prue	80	36	280,000
(6) South Langston, Logan; Wilcox	160	100	480,000
(7) Perkins, Lincoln; Hunton	480	35	1,440,000
(8) Cumberland, Marshall; Tulip Creek	800	100	8,000,000
(9) East Okemah, Okfuskee; Cromwell	280	36	980,000
(10) South Clarita, Coal; Wapanucka	80	20	120,000
(11) West Arno, Creek; Prue	320	90	960,000
(12) Prague, Pottawatomie; Skinner	480	30	1,440,000
(13) North Cromwell, Okfuskee; Cromwell	640	23	2,560,000
(14) East Cromwell, Okfuskee; Cromwell	360	14	1,440,000
(15) Mason, Okfuskee; Hunton	80	23	240,000
(16) North Okemah, Okfuskee; Hunton	240	25	720,000
(17) South Olive, Creek; Prue	80	10	280,000
(18) West Stillwater, Payne; Hunton	80	24	320,000
(19) Enid, Garfield; Mississippian	80	35	320,000
(20) West Wildhorse, Osage; Arbuckle	80	26	320,000
(21) South Hominy, Osage; Oswego	120	12	360,000
(22) Avery, Payne; Prue	80	23	240,000
(23) South Lovell, Logan; Layton	240	15	960,000
(24) North Tibbens, Creek; Wilcox	160	16	720,000
(25) East Stroud, Creek; Wilcox	260	19	1,040,000
(26) West Davenport, Lincoln; Prue	120	14	360,000
(27) Payson, Lincoln; Skinner	80	22	240,000
(28) Romulus, Pottawatomie; Hunton	220	39	880,000
(29) West Hewitt, Carter; sand	640	10	5,120,000
Total			33,000,000

Extensions

(30) Jackson, Seminole; Gilcrease	160	15	240,000
(31) Okemah, Okfuskee; Wilcox	240	56	840,000
(32) Gray, Pottawatomie; lime	320	12	640,000
(33) Skellyville, Lincoln; Hunton	360	100	1,080,000
(34) Fish, Seminole; Wilcox	320	10	1,600,000
(35) West Earlsboro, Pottawatomie; Viola	320	55	1,120,000
(35) West Earlsboro, Pottawatomie; Hunton	320	18	960,000
(36) Wilzetta, Lincoln; Simpson	320	15	1,280,000
(37) West Little River, Seminole; Wilcox	120	27	960,000
(38) Calvin, Hughes; Calvin	180	13	720,000
(39) Dill, Okfuskee; Cromwell	360	22	2,880,000
Total			12,320,000



KANSAS

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) N. Bornholdt, McPherson-Rice; chat	1,400	40	5,600,000
(2) Hall, Russell; Arbuckle	640	10	1,920,000
(3) Snider, Stafford; Simpson	400	30	1,600,000
(4) Ernsting, Barton; Arbuckle	320	12	1,120,000
(5) Rahn, Cowley; Bartlesville	120	40	540,000
(6) Knop, Barton; Arbuckle	400	11	1,400,000
(7) Krier, Barton; Arbuckle	320	10	1,120,000
(8) N.E. Stoltenberg, Ellsworth; Arbuckle	640	11	2,880,000
(9) Wondra, Barton; Lansing	200	40	800,000
(10) Gurney, Russell; basal	320	5	1,440,000
(11) Beaumont, Greenwood; Arbuckle	160	5	400,000
(12) Severy, Greenwood; Topeka	160	5	400,000
(13) Krier, Barton; Lansing	960	17	4,800,000
(14) Kroutwurst, Barton; Arbuckle	320	8	960,000
(15) Hoffman, Barton; Arbuckle	560	10	2,800,000
(16) Hall, Russell; Tarkio	160	5	640,000
(17) Bitikofer, McPherson; chat	240	31	720,000
(18) West Lost Springs, Marion; chat	20	10	60,000
(19) Haska, Ellsworth; Arbuckle	640	20	3,200,000
(20) McLouth, Jefferson; Mississippi	160	100	480,000
(21) Arkansas City, Cowley; Burbank	160	16	720,000
(22) Sanders, Ellis; Arbuckle	560	10	2,240,000
(23) Hammer, Barton; Arbuckle	320	20	960,000
(24) W. Bemis-Shutts, Ellis; Arbuckle	580	10	2,320,000
(25) Ray, Phillips; basal sand	160	15	640,000
(26) Karber, Rice; Arbuckle	180	12	720,000
(27) Lewis, Russell; Wabaunsee	240	18	720,000
(28) Bedford, Stafford; Arbuckle	520	20	2,080,000
(29) Riley, Stafford; Lansing	120	20	480,000
(30) Stafford, Stafford; Viola	560	25	2,800,000
(31) Henne, McPherson; Mississippi	240	100	960,000
(32) N.W. Greenvale, Russell; Lansing	240	18	840,000
(33) Geuda Springs, Cowley; Arbuckle	400	17	1,600,000
(34) Iuka, Pratt; Arbuckle	320	12	1,120,000
(35) Keesling, Rice; Arbuckle	120	21	480,000
(36) Raymond, Rice; Lansing	160	26	560,000
(37) Sellens, Russell; Arbuckle	160	11	480,000
(38) Trapp, Russell; Arbuckle	240	15	960,000
(39) Shallow Water, Scott; Mississippi	180	100	760,000
Total			54,320,000

INDIANA

Extension

(1) Griffin, Gibson-Posey	3,200	...	15,000,000

ILLINOIS

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Mattoon, Cole; McClosky	40	10	90,000
(2) Albion, Edwards; Chester, McClosky	720	10-15-9	2,160,000
(3) Inman, Gallatin; Rosiclare, McClosky	40	8	80,000
(4) Dale, Hamilton; Cypress, McClosky	400	8-28	1,600,000
(5) Boos, Jasper; McClosky	40	9	120,000
(6) West Liberty, Jasper; McClosky	400	16	1,800,000
(7) Lancaster, Wabash; McClosky	320	10	960,000
(8) Maud, Wabash; Bethel, McClosky	100	12-9	250,000
(9) Mount Carmel, Wabash; Cypress	80	20	160,000
(10) Burnt Prairie, White; McClosky	200	8	680,000
(11) Centerville, White; McClosky	60	12	150,000
(12) Iron, White; Hardinsburg, McClosky	640	16	1,920,000
(13) Irvington, Washington; Devonian	200	6	100,000
(14) ..... Wayne; McClosky	10	5	15,000
(15) Centralia, Clinton; Trenton	10	7	5,000
(16) Irvington, Washington; Devonian	200	12	500,000
(17) Roland, White; Tar Springs	40	12	80,000
(18) North Boos, Jasper; McClosky	140	15	560,000
(19) Hoodville, Hamilton; Bethel, McClosky	780	15-11	3,510,000
(20) North New Harmony, White; Tar Springs	500	24	2,250,000
(21) Waggoner, Montgomery; Pennsylvanian	40	13	80,000
(22) Woburn, Bond; Bethel	360	10	700,000
(23) Hidalgo, Jasper; McClosky	40	8	80,000
(24) Herald, White; Pennsylvanian	60	12	120,000
(26) West Centralia, Clinton; Bethel	20	12	50,000
(27) Thompsonville, Franklin; McClosky	350	11	1,080,000
(28) Phillipstown, White; Aux Vases	100	22	250,000
(30) Tonti, Marion; McClosky	120	9	300,000
(31) Belle Prairie, Hamilton; McClosky	20	4	40,000
(32) Mason, Effingham; McClosky	40	8	80,000
(33) McKinley, Washington; Bethel	20	9	40,000
(34) Carmi, White; McClosky	20	8	40,000
(35) Omaha, Gallatin; Palestine	40	30	160,000
(36) Woodlawn, Jefferson; Bethel	40	12	100,000
Total			120,090,000

Extensions

(1) Barnhill, Wayne; McClosky	140	9	500,000
(2) Enterprise, Wayne; McClosky	610	12	2,500,000
(3) Dundas, Richland; McClosky, Weller	700	8	2,800,000
(4) Griffin, Wabash; Penn-Chester-McClosky	200	15	900,000
(5) Mill Shoals, White; McClosky-Aux Vases	200	17	500,000
(6) Calvin, White; Chester ss. and McClosky	1,000	13	6,000,000
(7) Storms, White; Waltersburg	1,800	24	6,680,000
(8) Tonti, Marion; McClosky	400	15	1,600,000
(9) Salem, Marion; Chester-McClosky-Devonian	2,140	20	16,300,000
(10) Centralia, Marion-Clinton; Devonian	1,650	12	9,900,000
(11) Louden, Fayette; Chester sands	440	17	2,000,000
(12) Bartelso, Clinton; Devonian	110	7	320,000
Total			50,000,000

MICHIGAN

Discoveries

(1) Holland, Ottawa; Traverse	20	...	20,000
(2) South Overisel, Van Buren; Traverse	80	...	120,000
(3) Heath, Allegan; Traverse	40	...	20,000
(4) Dalton, Muskegon; Traverse	10	...	5,000
(5) North Overisel, Van Buren; Traverse	160	...	480,000
(6) Grout, Clare; Dundee	40	...	120,000
(7) Adams, Arenac; Dundee	320	...	1,600,000
(8) Geneva, Van Buren; Traverse	40	...	80,000
(9) Hamilton, Clare; Dundee	20	...	10,000
(10) Casco, Allegan; Traverse	40	...	20,000
(11) Niles, Berrien; Traverse	10	...	2,000
(12) Georgetown, Ottawa; Traverse	20	...	10,000
(13) Bi-State, Cass; Traverse	10	...	10,000
(14) Winterfield, Clare; Dundee	40	...	120,000
(15) Marion, Clare; Dundee	20	...	60,000
(16) Tallmadge, Ottawa; Beren	10	...	3,000
(17) Reed City, Osceola; Monroe	10	...	15,000
(18) Overisel 11, Allegan; Traverse	20	...	10,000
Total			2,705,000

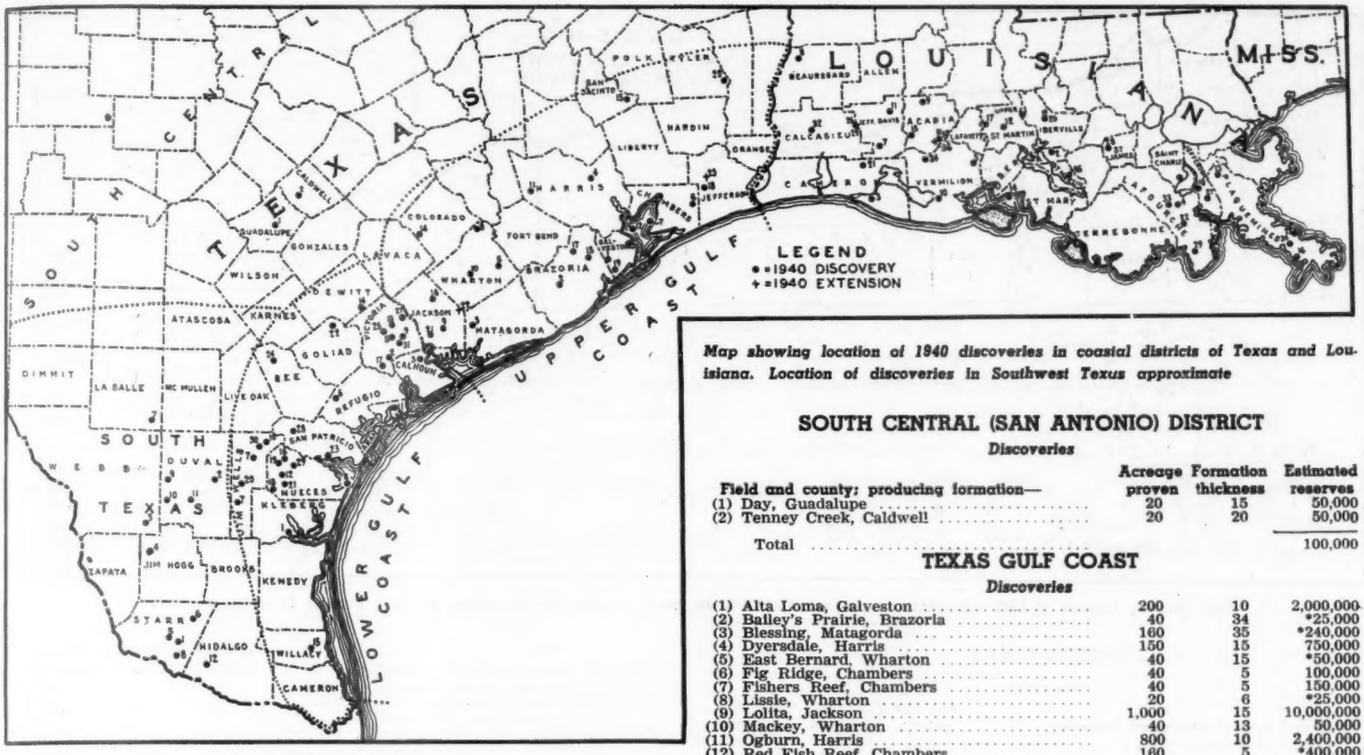
NEBRASKA

Discoveries

(1) Shubert, Richardson	100	10	50,000
(2) Walmsley, Richardson	100	10	50,000
Total			100,000

Extension

(3) Falls City, Richardson	640	15	3,000,000



Map showing location of 1940 discoveries in coastal districts of Texas and Louisiana. Location of discoveries in Southwest Texas approximate

SOUTH CENTRAL (SAN ANTONIO) DISTRICT

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Day, Guadalupe	20	15	50,000
(2) Tenney Creek, Caldwell	20	20	50,000
Total			100,000

TEXAS GULF COAST

Discoveries

(1) Alta Loma, Galveston	200	10	2,000,000
(2) Bailey's Prairie, Brazoria	40	34	*25,000
(3) Blessing, Matagorda	160	35	*240,000
(4) Dyersdale, Harris	150	15	750,000
(5) East Bernard, Wharton	40	15	*50,000
(6) Fig Ridge, Chambers	40	5	100,000
(7) Fishers Reef, Chambers	40	5	150,000
(8) Lissie, Wharton	20	6	*25,000
(9) Lolita, Jackson	1,000	15	10,000,000
(10) Mackey, Wharton	40	13	50,000
(11) Ogburn, Harris	800	10	2,400,000
(12) Red Fish Reef, Chambers	160	5	*400,000
(13) Rowan, Brazoria	200	16	2,400,000
(14) Sheridan, Colorado	120	10	1,200,000
(15) Shepherd, San Jacinto	40	62	*110,000
(16) West Ganado, Jackson	20	16	100,000
Total			19,000,000

New Sands

(17) Chocolate Bayou, Brazoria; 11,400 ft.	100	3	100,000
(18) Fannett, Jefferson; 8,200 ft.	50	20	1,250,000
(19) Greens Lake, Galveston; 6,450 ft.	100	10	500,000
(20) Spurger, Tyler; 4,700 ft.	20	10	240,000
(21) West Ranch, Jackson; 6,100 ft.	20	6	120,000
Total			3,110,000

Extension

(22) Mauritz, Jackson, miscellaneous feet	200	6	600,000
(23) South China, Jefferson, miscellaneous feet	350	10	1,750,000
Total			2,350,000

*Distillate.

LOUISIANA GULF COAST

Discoveries

(1) Bayou de Glaise, Iberville	10	9	25,000
(2) Bayou Pigeon, Iberia	80	25	800,000
(3) Chenier Ridge, Cameron	20	6	20,000
(4) Delta Farms, La Fourche	680	41-16	10,200,000
(5) Erath, Vermilion	80	11	400,000
(6) Lake Salvador, Plaquemines (St. Charles)	120	125	7,250,000
(7) Nibletts Farm, Jefferson Davis	20	20	10,000
(8) Neale, Beauregard	800	15	8,000,000
(9) Ritchie, Acadia	20	10	50,000
(10) Schooner Bayou, Vermilion	20	10	750,000
(11) South China, Jefferson Davis	20	5	10,000
(12) Section 28, St. Martin	10	15	25,000
(13) Stella, Plaquemines	80	10	800,000
(14) West Cote Blanche, St. Mary	160	28-10-25	3,200,000
(15) West Mermentau, Acadia	20	11	25,000
(16) West Bay, Plaquemines	20	16	150,000
Total			31,715,000

New Sands

(17) Anse La Butte, St. Martin; 4,500 ft. (Breaux)	40	20	800,000
2,450 ft. (first Moresi)	20	25	200,000
4,700 ft. (Patin)	120	40	9,600,000
3,650 ft. (Patrick)	20	10	100,000
2,850 ft. (second Moresi)	10	48	240,000
3,250 ft. (Bergeron)	10	30	150,000
1,300 ft. (Rice)	20	20	50,000
(18) Barataria, Jefferson; 8,700 ft.	20	6	50,000
(19) Bayou Blue, Iberville; 4,600 ft.	10	10	50,000
(20) Bayou Blue, Iberville; 5,000 ft.	10	10	50,000
(21) Chalkley, Cameron; 10,000 ft.	40	10	80,000
(22) Golden Meadow, La Fourche; 10,300 ft.	20	23	500,000
(23) Grand Bay, Plaquemines; 10,000 ft.	640	10	4,800,000
(24) Gueydan, Vermilion; 9,200 ft.	20	6	*10,000
(25) Iowa, Calcasieu-Jefferson Davis; 8,200 ft.	100	30	2,000,000
(26) Iowa, Calcasieu-Jefferson Davis; 7,500 ft.	10	10	50,000
(27) Lafitte, Jefferson; 4,400 ft.	20	10	40,000
(28) La Pice, St. James; 7,600 ft.	40	6	200,000
(29) Leeville, La Fourche; 8,400 ft.	20	10	100,000
(30) South Crowley, Acadia; 7,100 ft.	5	20	20,000
(31) South Crowley, Acadia; 5,600 ft.	20	10	50,000
(32) Sulphur, Calcasieu; 6,300 ft.	15	10	100,000
(33) Valentine, La Fourche; 7,000 ft.	20	20	250,000
(34) Venice, Plaquemines; 7,700 ft.	20	34	500,000
(35) West Lake Verret, St. Martin; 7,400 ft.	14	20	200,000
Total			22,160,000

Extensions

(36) South Crowley, Acadia; 7,600 ft.	20	10	100,000

*Distillate.

SOUTHWEST TEXAS

LOWER GULF COAST (CORPUS CHRISTI) DISTRICT

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Baffin Bay, Kleberg	40	5	200,000
(2) Bloomington, Victoria	60	5	150,000
(3) Duck Bay, Calhoun	40	5	50,000
(4) East Flour Bluff, Nueces	240	10	1,800,000
(5) Edwards, Victoria	80	5	80,000
(6) Fagan, Refugio	200	5	300,000
(7) Gallagher, Jim Wells	120	20	600,000
(8) Henshaw, Jim Wells	40	5	120,000
(9) North Keeran, Victoria	10	5	50,000
(10) Orange Grove, Jim Wells	600	10	4,500,000
(11) St. Charles, Aransas	40	10	100,000
(12) Shield, Nueces	40	5	100,000
(13) Terrell, Victoria	20	10	20,000
(14) Thomaston, De Witt	80	30	120,000
(15) Willamar, Willacy	40	39	1,000,000
(16) East Agua Dulce, Nueces	20	15	40,000
Total			9,230,000

New Sands

(17) McFaddin, Victoria; 5,925-ft.	20	5	50,000
(18) Stratton, Nueces; 6,700-ft.	250	22	5,250,000
(19) Agua Dulce, Nueces; 6,800-ft.	40	12	400,000
(20) Ben Bolt, Jim Wells; 4,875-ft.	10	12	15,000
(20) Ben Bolt, Jim Wells; 4,910-ft.	20	18	100,000
(21) South Clara Driscoll, Nueces; 5,825-ft.	20	6	90,000
(22) Weser, Goliad; 5,850-ft.	20	6	20,000
(23) East White Point, San Patricio; 4,930-ft.	10	6	5,000
(24) West Tuleta, Bee; 7,500-ft.	20	15	*20,000
(25) Victoria, Victoria; 2,550-ft.	10	3	5,000
(26) Richard King, Nueces; 5,650-ft.	400	6	1,000,000
(27) Telferner, Victoria; 2,700-ft.	20	4	10,000
(28) East Mathis, San Patricio; 5,600-ft.	20	4	20,000
(29) Robstown, Nueces; 4,590-ft.	10	7	40,000
(30) Wade City, Jim Wells; 4,800-ft. 4,900-ft., 5,100-ft.	400	15	6,000,000
Total			13,425,000

Extensions

(31) Keeran, Victoria	10	1	10,000
(32) Mauritz, Jackson	80	6	200,000
Total			210,000

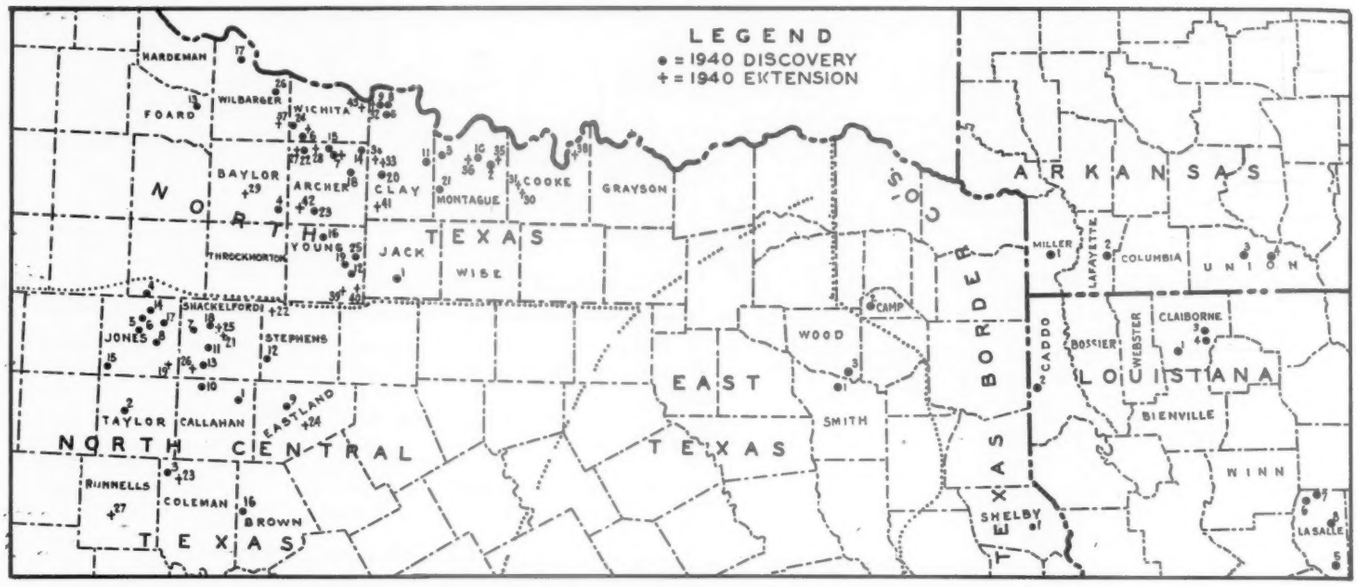
SOUTH (LAREDO) DISTRICT

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Boyle, Starr	640	7	1,000,000
(2) Bridwell, Duval	40	5	100,000
(3) Glen, Webb	1,080	12	2,700,000
(4) Holbein, Jim Hogg	10	5	120,000
(5) Manila, Starr	100	5	220,000
(6) North Rincon, Starr	60	10	300,000
(7) Washburn, La Salle	10	10	40,000
(8) Yzaguirre, Starr	10	10	25,000
(12) Nichols, Hidalgo	20	10	30,000
Total			4,535,000

New Sands

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(9) Peters, Duval; 2,460-ft.	10	2	5,000
(10) Bruni, Webb; 5,620-ft.	10	6	5,000
(11) Conoco Driscoll, Duval; 2,530-ft.	30	5	75,000
Total			85,000



Map showing location of 1940 discoveries in southern Mid-Continent area. Location of discoveries in North Central Texas approximate

NORTH TEXAS

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Cooper-Steed, Jack; Bryson sand	400	24	3,200,000
(2) Bonita, Montague; upper Bend	300	8	2,400,000
(3) Ringgold, Montague; Bend	320	14	2,560,000
(4) Hall-Jordan, Baylor; Palo Pinto (Canyon)	160	3	640,000
(5) South Costley, Clay; Cisco	60	4	150,000
(7) Bonita conglomerate, Montague; Bend	350	13	3,150,000
(6) K.M.A. Deep, Wichita; Ellenburger (Ord.)	300	37	1,500,000
(7) Hull-Silk shallow, Archer; upper Cisco	200	10	500,000
(8) McIness, Clay; Cisco	60	6	150,000
(9) Taylor-Costley, Clay; Cisco	60	5	150,000
(10) Benton, Montague; Bend lime	40	15	240,000
(11) Hapgood, Clay; Bend conglomerate	60	12	420,000
(12) Strong, Young; Marble Falls (Bend)	80	30	520,000
(13) Allee, Foard; Canyon	160	24	480,000
(7) Hull-Silk Caddo, Archer; Caddo lime (Bend)	1,000	14	9,000,000
(14) Vogtsberger, Archer; Strawn	80	77	640,000
(15) Holliday (2 pays), Archer; Cisco	700	20	1,650,000
(3) Ringgold Deep, Montague; Bend	20	5	80,000
(16) Rogers, Young; Cisco	300	10	750,000
(17) Fargo, Wilbarger; Strawn	640	15	3,840,000
(18) Coleman. Archer; Caddo lime (Bend)	40	49	280,000
(19) Humphrey-Jeffery, Young; Mississippian	40	35	220,000
(20) Howard, Clay; Caddo lime (Bend)	20	28	60,000
(21) Hults-Owens, Montague; Nocona lime (Bend)	40	34	280,000
(22) Kadane-Griffin, Archer; Strawn	40	14	280,000
(17) Fargo Deep, Wilbarger; Strawn	400	59	2,400,000
(23) Young & Woody, Archer; Cisco	20	4	50,000
(24) Barnes, Wichita; Strawn	40	42	200,000
(12) Fargo (middle pay), Wilbarger; Strawn	80	10	400,000
(25) Kerlyn-Dalrymple, Young; Strawn	20	31	80,000
(26) Morris, Wilbarger; Canyon	20	13	60,000
Total			36,310,000

Extensions

(27) Griffin, Archer; Strawn	100	24	500,000
(7) Hull-Silk (4,300-ft.), Archer; Strawn	3,000	45	21,000,000
(28) Mankins Deep, Archer; Caddo lime	200	30	1,400,000
(29) Seymour, Baylor; Palo Pinto lime	1,500	20	12,000,000
(20) T.C.U., Cooke; Strawn	100	15	300,000
(31) Voth, Cooke; Ellenburger	100	15	600,000
(32) Costley, Clay; Cisco	40	4	100,000
(33) Halsell, Clay; Strawn	500	42	3,750,000
(34) Ross, Clay; Smithwick (Bend)	600	55	4,800,000
(35) Benton & Holmes (was Bowers); Montague, Strawn	250	25	2,000,000
(36) Rogers & Rogers, Montague (4 pay); Strawn Bend	1,500	50	15,000,000
(37) Consolidated, Wilbarger; Strawn 2 pays)	640	50	4,480,000
(38) Walnut Bend, Cooke (3 pays); Strawn, Bend	500	100	5,000,000
(6) K.M.A., Wichita; Strawn (?)	2,000	100	15,000,000
(39) Knight, Young; Bend	250	25	2,000,000
(40) Sewell, Young; Bend	150	25	900,000
(41) Antelope (was Henderson), Clay; Strawn	800	40	4,800,000
(42) Archer County (shallow); Cisco	150	...	3,750,000
(43) Wichita County shallow); Cisco	150	...	3,750,000
Total			101,130,000

NORTH CENTRAL TEXAS

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Slaughter, Callahan; Cisco	20	5	30,000
(2) South View, Taylor; Cisco	500	66	1,500,000
(3) Gayle, Coleman; Strawn	40	10	80,000
(4) Nowles, Haskell; Palo Pinto (Canyon)	600	10	3,000,000
(5) Triplett, Jones; Cook sand	80	10	280,000
(6) Reid, Jones; Gunsight lime	640	3	1,600,000
(7) Jackson, Shackelford; Cisco	80	8	240,000
(8) Humphrey, Jones; Flippen sand	20	12	40,000
(9) McElreath, Eastland; Caddo lime	80	72	240,000
(10) Harris, Calahan; Tannehill sand	40	10	80,000
(11) Choate, Shackelford; Hope sand	40	8	80,000
(12) Stribling Deep, Stephens; Mississippian	40	106	160,000
(13) Swenson, Shackelford; Cisco	20	6	40,000
(14) Olson, Jones; Palo Pinto lime	40	20	120,000
(5) Triplett, King Level, Jones; King sand	40	11	100,000
(15) Sandefer-Weinke, Jones; Cisco	20	3	50,000
(16) Hogan-Stewart, Brown; Canyon	20	13	30,000
(17) Carson-Elliott, Shackelford; Caddo lime	40	35	80,000
(18) Newell, Shackelford; Hope sand	40	71	100,000
(19) Kelso, Jones; Cook sand	20	6	80,000
Total			7,930,000

Extensions

(21) Roeser-Cook, Shackelford; Cook sand	100	15	400,000
(22) Loving, Stephens; Caddo lime	60	20	240,000
(23) Novice, Coleman; Strawn	80	25	480,000
(24) Dobbs (or South Carbon), Eastland; Caddo	100	50	500,000
(25) Cook, Shackelford; Cook sand	150	15	750,000
(26) Shackelford County (shallow); Cisco	200	...	500,000
(27) Beddo, Runnels; Canyon	200	20	200,000
Total			3,070,000

EASTERN TEXAS

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Chapel Hill, Smith; upper Pettit	2,000	22	8,000,000
(1) Chapel Hill, Smith; lower Pettit	500	153	2,000,000
(2) Pittsburg, Camp; Pettit	40	42	120,000
(3) Morrison, Wood; Woodbine	250	6	2,000,000
(4) Hawkins, Wood; Woodbine	640	78	6,400,000
Total			18,520,000

Extensions

(5) Bazzette, Navarro; Woodbine	100	15	400,000
(6) Long Lake, Anderson-Freestone; Woodbine	150	32	1,500,000
(7) Cayuga, Aderson-Freestone; Woodbine	200	35	2,000,000
(8) Opelika, Henderson; Trinity (distillate)	400	25	.....
Total			3,900,000

ARKANSAS

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Fouke, Miller; Paluxy	120	15	720,000
(2) McKamie, Lafayette; Smackover lime	240	85	2,520,000
(3) Nick Springs, Union; Hosston	240	12	1,700,000
(4) Urbana, Union; Crain sand (new horizon)	160	6	1,300,000
Total			6,240,000

Extensions

(1) Atlanta, Columbia; Smackover lime	640	25	4,514,000
(2) Buckner, Lafayette; Smackover lime	920	20	9,500,000
(3) Dorcheat, Columbia; Smackover lime	320	35	9,600,000
Total			23,614,000

NORTH LOUISIANA

Discoveries

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Lisbon, Claiborne; Hosston (new horizon)	100	14	700,000
(2) Nebo, La Salle; Wilcox	340	8	1,700,000
(3) Olla, La Salle; Wilcox	3,880	15	19,400,000
Total			21,800,000

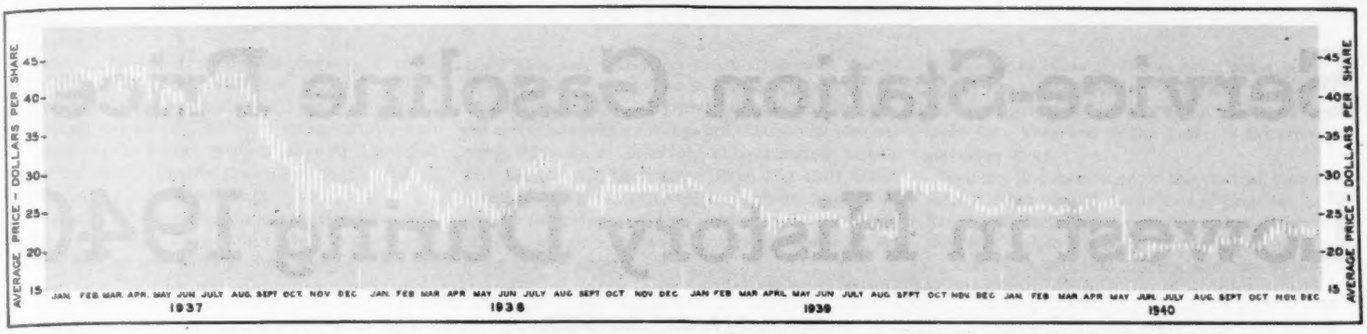
MISSISSIPPI

Discovery

Field and county; producing formation—	Acreage proven	Formation thickness	Estimated reserves
(1) Pickens, Yazoo; Eutaw	160	5	400,000

Extension

(1) Tinsley, Yazoo; Selma, Eutaw-Tuscaloosa	4,600	20	46,000,000



Average of high and low quotations on 30 representative common stocks listed on New York markets. Uppermost point on each vertical line represents average of highs while the base represents average of lows. Data reflect market at close of each week

TRENDS in the market value of oil STOCKS

(Averages Compiled by Carl H. Pforzheimer & Co., Member of New York Stock Exchange and New York Curb Exchange)

1938	HIGH	LOW	CLOSE
January 8	30.15	27.38	29.89
January 15	31.03	29.31	30.30
January 22	30.52	29.10	29.45
January 29	29.62	27.02	27.25
February 5	28.31	26.76	27.75
February 12	28.74	27.21	28.42
February 19	29.50	27.99	29.42
February 26	31.01	29.47	30.28
March 5	30.41	28.98	29.26
March 12	29.28	27.62	27.99
March 19	28.9	26.6	27.3
March 26	27.79	24.18	24.41
April 2	25.14	22.69	24.64
April 9	26.99	24.36	26.84
April 16	28.07	25.80	27.98
April 23	28.33	26.47	27.75
April 30	27.48	25.91	26.19
May 7	27.74	25.83	27.57
May 14	27.89	26.23	26.55
May 21	26.55	25.25	25.32
May 28	25.71	24.14	24.55
June 4	25.52	24.51	25.38
June 11	26.39	25.12	25.87
June 18	26.04	25.05	25.62
June 25	29.21	25.95	28.97
July 2	31.12	28.53	30.90
July 9	31.49	29.90	30.73
July 16	32.17	29.99	31.39
July 23	32.60	31.05	32.15
July 30	32.64	30.76	31.32
August 6	29.50	28.76	29.18
August 13	31.64	29.32	29.58
August 20	30.46	29.42	40.04
August 27	30.61	29.03	29.23
September 3	29.35	28.01	28.95
September 10	29.19	27.86	28.03
September 17	28.34	25.89	26.46
September 24	28.27	26.09	26.73
October 1	29.09	25.31	28.92
October 8	29.93	27.94	28.45
October 15	28.70	27.08	27.93
October 22	29.14	27.29	28.78
October 29	29.40	28.10	28.36
November 5	28.98	27.93	28.55
November 12	29.87	28.40	29.53
November 19	29.58	28.14	28.50
November 26	29.02	28.07	28.41
December 3	28.79	27.63	28.14
December 10	28.59	27.42	28.73
December 17	29.21	27.57	28.63
December 24	28.93	27.81	28.50
December 31	29.66	27.91	28.52

1939	HIGH	LOW	CLOSE
January 7	29.89	28.88	29.09
January 14	29.19	28.17	28.59
January 21	29.04	28.18	28.37
January 28	28.12	26.34	26.97
February 4	27.98	27.06	27.68
February 11	27.78	27.09	27.34
February 18	27.73	27.03	27.42
February 25	27.75	26.85	27.37
March 4	27.93	26.95	27.90
March 11	28.70	27.44	28.40
March 18	28.53	26.72	26.85
March 25	27.31	26.15	26.64
April 1	26.77	24.52	25.07
April 8	25.72	23.09	23.15
April 15	24.89	22.64	24.57
April 22	25.17	23.46	24.89
April 29	25.24	24.21	24.50
May 6	25.09	24.12	24.79
May 13	25.28	24.50	24.83
May 20	25.10	24.18	24.66
May 27	25.69	24.43	25.10
June 3	25.68	24.77	25.15
June 10	25.89	24.84	25.71
June 17	25.72	24.62	25.53
June 24	25.43	24.76	24.92
July 1	24.92	23.53	23.88
July 8	24.38	23.73	24.00
July 15	24.63	23.92	24.88
July 22	25.46	24.33	25.00
July 29	25.26	24.32	24.64
August 5	24.87	23.88	24.05
August 12	24.13	23.13	23.33
August 19	23.86	22.96	23.20
August 26	23.49	22.09	23.18
September 2	25.58	22.29	24.99
September 9	30.22	27.84	29.41
September 16	30.86	28.64	29.20
September 23	29.97	27.92	29.42
September 30	29.78	28.23	29.11
October 7	29.51	27.95	28.68
October 14	29.34	28.30	28.89
October 21	29.78	28.57	29.14
October 28	29.44	28.37	28.81
November 4	29.05	27.07	28.60
November 10	28.58	27.37	27.57
November 18	28.09	26.93	27.51
November 25	27.85	26.63	26.87
December 2	27.14	25.94	26.22
December 9	26.62	25.78	26.03
December 16	26.28	25.19	25.78
December 23	26.40	25.34	26.03
December 30	26.77	25.59	26.43

1940	HIGH	LOW	CLOSE
January 6	27.69	26.53	27.18
January 13	27.35	25.91	26.03
January 20	26.32	25.48	25.95
January 27	26.37	25.64	26.01
February 3	26.23	25.55	25.87
February 10	26.54	25.70	26.27
February 17	26.59	25.96	26.25
February 24	26.56	25.62	25.74
March 2	25.69	25.06	25.29
March 9	26.36	25.30	26.04
March 16	26.38	25.52	25.61
March 23	25.94	25.36	25.69
March 30	26.33	25.45	26.09
April 6	27.21	25.96	26.93
April 13	27.21	26.21	26.37
April 20	26.96	25.69	26.30
April 27	26.32	26.13	26.52
May 4	27.21	26.08	26.85
May 11	27.42	26.11	26.55
May 18	26.39	21.65	22.04
May 25	22.35	19.04	19.99
June 1	20.76	19.22	19.95
June 8	20.58	19.39	20.18
June 15	21.91	19.52	21.42
June 22	21.77	20.54	21.07
June 29	21.54	20.28	20.84
July 6	21.12	20.60	20.92
July 13	21.34	20.54	20.97
July 20	21.38	20.90	21.12
July 27	21.38	20.80	21.12
August 3	21.61	20.94	21.29
August 10	21.38	20.70	21.07
August 17	21.19	20.38	20.56
August 24	21.07	20.44	20.82
August 31	21.44	20.57	21.32
September 7	22.42	21.13	22.09
September 14	22.09	21.26	21.43
September 21	22.01	21.39	21.80
September 28	22.37	21.37	21.44
October 5	22.03	21.24	21.69
October 12	21.72	20.99	21.18
October 19	21.49	20.87	21.21
October 26	21.75	20.81	21.56
November 2	22.71	21.24	22.43
November 9	23.82	21.81	23.37
November 16	24.40	22.86	23.75
November 23	24.12	23.03	23.50
November 30	23.89	22.68	23.17
December 7	23.65	22.47	23.10
December 14	23.77	22.68	23.40
December 21	23.57	22.59	22.94
December 28	23.49	22.58	23.14

Thirty companies whose common stocks make up the average values shown above: Amerada, Atlantic, Barnsdall, Consolidated, Continental, Creole, Gulf, Humble, Imperial, International, Mid-Continent, Ohio, Phillips, Plymouth, Pure Oil, Seaboard Oil, Shell Union, Skelly, Socony, South Penn, Standard of California, Standard of Indiana, Standard of Kentucky, Standard of New Jersey, Standard of Ohio, Sun, Texas Co., Texas Pacific Coal & Oil Co., Tide Water Associated, and Union Oil Co.

Service-Station Gasoline Price Lowest in History During 1940

By H. STANLEY NORMAN

THE lowest average service-station price for gasoline in the history of the oil industry—12.71 cents per gallon exclusive of taxes—prevailed in 1940, a reduction of 0.58 cent from the previous year. Thus the industry maintained unbroken its record of supplying constantly improved products to the consuming public at lower prices.

Incompatability of 1940 marketing operations with a reasonable profit becomes more glaring when it is considered that dealer margins on regular-grade motor fuel fell in the range of 3.5 cents per gallon. Deduction of the dealer margin from the average service-station price of 12.71 cents leaves approximately 9.21 cents per gallon for the entire operation of refining and transporting gasoline to the points of consumption scattered throughout the United States. In addition to paying the processing and distribution costs out of 9.21 cents per gallon for motor fuel, refiners had to take out the cost of raw material which averaged almost 2.5 cents per gallon on the basis of $1 crude.

Not since 1933 when the average service-station price was 12.76 cents per gallon have United States motorists come close to enjoying such economical transportation as existed in 1940.

Immediate outlay by motorists did not change materially from 1939 because the average of taxes rose during the year to 5.9 cents per gallon compared to 5.4 cents in the preceding year. The increment of 0.5 cent per gallon in the average tax load on motorists came July 1 when the added federal levy in this amount became effective. Based on service-station gasoline prices and taxes prevailing throughout the country, the composite motorist spent 18.61 cents per gallon for his motor fuel in 1940. The average prices, of course, are not based on volume since several of the largest consuming centers were plagued with the most unsettled marketing conditions.

Most Cities Show Price Decline

There were four out of 50 representative cities in the country selected by The Oil and Gas Journal for compilation of its service-station price record which started 1941 with gasoline markets of less than 10 cents per gallon whereas only one fell in that category at the start of 1940. Nine cities out of the 50 started 1941 with service-station prices identical with those of January 1, 1940. The remaining 37 cities all suffered declines ranging from 0.5 to 5.5 cents per gallon. Marketing conditions were most severely disturbed in the New England states and around New York which constitute the largest consuming section of the United States.

Indicative of the unsettled market conditions is the record of 16 price changes during the year at Portland, Me., 14 at Boston, Mass., and 12 in New York City. The record for rapidity of changes went to New York City where there were five different dealer tank-wagon prices in October alone. Boston ran a close second with four price changes in December.

Service-station prices at the 50 cities were interpolated by The Oil and Gas Journal from the posted dealer tank-wagon quotations, exclusive of taxes plus dealer margins, determined as accurately as conditions permit. Recognition is given to the inability to take all dealer-margin vagrancies into account in compiling this record. Dealer margins vary from station to station, depending upon the policy of individual dealers and the competitive conditions which in certain localities change as often as two or three times daily. Oil-company connection with service-station prices is severed, under marketing plans covering a large majority of the gallonage, when tank-wagon delivery into the tanks of dealers is effected.

Market disturbances were most frequent in the northeastern part of the country, but the average service-station price there had declined only a net of 1.54 cents per gallon in the year. Average prices January 1, 1941, declined 1.82 cents in the southeastern part of the country and 2.07 cents in the midwestern, compared to 1940 opening prices. The central states were least influenced by market

Year-to-Year Trend of Retail Gasoline Prices

Average Service-Station Prices in Cents in 50 Representative Cities, Exclusive of Tax

	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
January 1	14.56	12.87	12.54	14.32	12.90	13.70	14.09	14.08	13.23	13.48
February 1	14.83	12.97	11.63	13.87	13.16	14.21	14.10	14.07	12.80	13.32
March 1	14.86	12.91	11.49	14.18	13.22	14.22	14.46	13.99	13.01	13.19
April	13.68	13.18	11.58	14.57	13.28	13.87	14.47	14.12	13.08	13.02
May 1	12.40	13.59	11.60	13.55	13.64	14.27	14.55	14.08	13.20	12.81
June 1	12.21	13.68	10.82	13.93	13.90	14.31	14.58	14.05	13.27	12.57
July 1	12.46	14.21	13.06	14.06	14.00	14.26	14.42	14.08	13.52	12.56
August 1	12.41	14.02	13.52	13.98	14.10	14.24	14.54	14.08	13.40	12.53
September 1	12.21	13.65	14.00	13.89	13.78	14.21	14.53	13.97	13.49	12.67
October 1	12.34	12.46	14.45	13.55	13.42	14.07	14.49	13.75	13.40	12.28
November 1	12.32	13.04	14.30	11.92	13.46	13.99	14.45	13.39	13.61	11.98
December 1	12.89	12.96	14.17	12.43	13.69	13.97	14.13	13.27	13.44	12.16
Average	13.09	13.30	12.76	13.60	13.55	14.11	14.40	13.91	13.29	12.71

Comparison of Net Service-Station Prices January 1, 1940, and January 1, 1941

Atlantic and New England States

	Jan. 1 1940	Jan. 1 1941
Portland, Me.	12.5	10.1
Burlington, Vt.	13.5	10.8
Hartford, Conn.	12.0	9.5
Boston, Mass.	12.0	9.2
New York, N. Y.	10.7	9.0
Philadelphia, Pa.	11.0	10.0
Providence, R. I.	12.3	10.0
Newark, N. J.	12.2	11.6
Baltimore, Md.	12.75	12.25
Dover, Del.	12.0	12.0
Washington, D. C.	12.5	12.0
Average	12.13	10.59

Central

Fargo, N. D.	14.7	14.7
Huron, S. D.	14.0	14.0
Wichita, Kans.	10.6	11.4
Omaha, Neb.	10.5	12.9
Tulsa, Okla.	8.0	9.0
Dallas, Tex.	11.0	10.0
Little Rock, Ark.	13.75	12.0
Kansas City, Mo.	12.4	10.8
Des Moines, Iowa	11.9	12.9
Duluth, Minn.	13.9	13.9
Minneapolis, Minn.	13.0	12.7
Milwaukee, Wis.	13.8	13.3
Chicago, Ill.	12.1	11.1
Peoria, Ill.	12.2	12.2
Detroit, Mich.	11.6	11.6
Indianapolis, Ind.	12.8	12.8
Cleveland, Ohio	14.0	14.0
Average	12.35	12.31

Southeastern

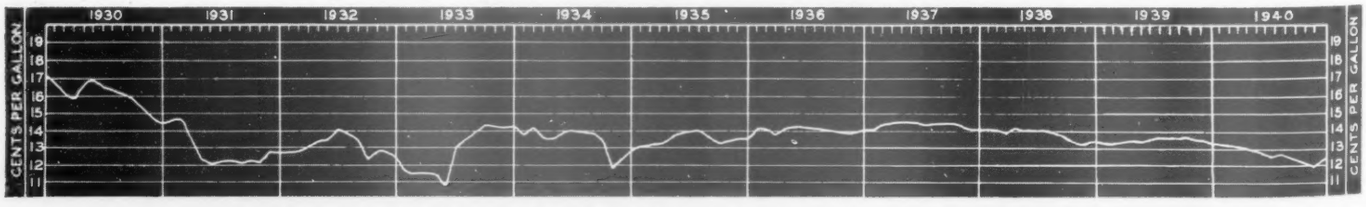
	Jan. 1 1940	Jan. 1 1941
Norfolk, Va.	13.75	12.75
Charleston, W. Va.	14.55	13.55
Louisville, Ky.	13.0	12.0
Memphis, Tenn.	13.5	12.5
Atlanta, Ga.	15.0	11.0
Charlotte, N. C.	14.9	10.5
Charleston, S. C.	13.75	12.75
Jackson, Miss.	13.5	12.5
Birmingham, Ala.	14.5	12.0
New Orleans, La.	13.25	11.75
Jackson, Fla.	12.0	10.5
Average	13.8	11.98

Midwestern

Helena, Mont.	18.5	13.0
Boise, Idaho	19.0	16.0
Casper, Wyo.	16.5	15.0
Reno, Nev.	16.5	15.0
Salt Lake City, Utah	14.5	14.5
Denver, Colo.	14.5	13.0
Phoenix, Ariz.	15.0	15.0
Albuquerque, N. M.	15.0	11.5
Average	16.19	14.12

Western Coast

San Francisco, Calif.	14.5	13.0
Portland, Ore.	15.0	13.5
Seattle, Wash.	15.0	13.5
Average	13.83	13.33



Trend of average gasoline service-station prices, exclusive of taxes, in 50 representative cities throughout the United States during past 10 years

variations. The central district January 1 price declined only 0.04 cent per gallon, but part of this apparent stability was reflected by adjustment of subnormal prices at a few key cities. There was only one service-station price change of a general character on the Pacific Coast and that occurred May 28 with a cut of 1.50 cents.

Congestion of consumption and concomitant concentration of retail marketing outlets in the northeastern part of the country contributed the customary hills and valleys in prices. Inherent northeastern-market disturbances were aggravated in 1940 by the seriously depressed cargo market on the Gulf Coast where "slugs" of distress motor fuel were released at intervals at concession prices. The surges and backlashes from the Gulf Coast primary market registered uncommon impact on the northeastern and southeastern marketing territories, because the equalization influence of exports is now absent.

Markets in some of the eastern coast cities regained fractions of their lost ground in December but the contraseasonal-market advances were all more than absorbed in the bulge of tanker transportation costs.

Relative independence of the central motor-fuel market from coastal conditions is probably one of the reasons why service-station prices there were the least varied. Another factor was the decline of Illinois production during the last 6 months.

Gasoline Service-Station Prices in Effect During 1940, Exclusive of Taxes, in 50 Representative Cities, With Price Changes and Dates

	Dealer margin	Price Jan. 1, 1940																	Price Jan. 1, 1941	Tax Jan. 1, 1940	Tax Jan. 1, 1941
Birmingham, Ala.	4.0	14.5	4/17 13.5	7/5 13.0	10/30 12.0														12.0	8.0	8.5
Phoenix, Ariz.	4.0	15.0																	15.0	6.0	6.5
Little Rock, Ark.	4.0	13.75	2/21 13.25	8/9 12.0															12.0	7.5	8.0
San Francisco, Calif.	4.0	14.5	5/28 13.0																13.0	4.0	4.5
Denver, Colo.	4.0	14.5	2/5 13.0	3/8 12.0	6/25 14.0	8/3 12.0	10/1 13.0												13.0	5.0	5.5
Hartford, Conn.	2.5	12.0	3/14 11.3	5/1 10.8	5/26 9.5	7/5 9.0	12/3 9.5												9.5	4.0	4.5
Washington, D. C.	3.5	12.5	9/10 12.0																12.0	3.0	3.5
Dover, Del.	3.5	12.0	4/2 12.5	6/10 12.0															12.0	5.0	5.5
Jacksonville, Fla.	4.0	12.0	5/4 11.0	5/29 10.0	6/27 9.0	8/14 10.0	8/30 9.5	10/23 10.5	11/26 9.5	12/13 10.5									10.5	8.0	8.5
Atlanta, Ga.	4.0	15.0	1/18 14.0	2/27 15.0	4/20 14.5	5/3 13.0	7/12 12.5	8/27 11.0	9/19 12.5	9/26 11.0									11.0	7.0	7.5
Boise, Idaho	4.0	19.0	6/7 18.0	9/3 16.0															16.0	6.0	6.5
Chicago, Ill.	3.0	12.1	10/21 11.1																11.1	4.0	4.5
Peoria, Ill.	3.5	12.2																	12.2	4.0	4.5
Indianapolis, Ind.	3.5	12.8																	12.8	5.0	5.5
Des Moines, Iowa	3.5	11.9	7/3 12.9																12.9	4.0	4.5
Wichita, Kans.	3.5	10.6	5/1 11.1	8/21 11.4															11.4	4.0	4.5
Louisville, Ky.	3.5	13.0	4/19 12.0																12.0	6.0	6.5
New Orleans, La.	3.5	13.25	2/19 12.75	4/19 11.75															11.75	8.0	8.5
Portland, Me.	3.1	12.5	3/14 11.7	4/26 11.1	5/2 10.6	5/28 11.1	6/20 10.9	8/7 10.6	8/28 10.4	9/13 9.4	9/20 8.8	9/28 8.1	10/9 9.1	10/12 8.1	10/23 10.2	11/13 10.5	11/22 8.8	12/12 10.1	10.1	5.0	5.5
Baltimore, Md.	4.0	12.75	9/10 12.25																12.25	5.0	5.5
Boston, Mass.	3.0	12.0	3/14 11.0	4/5 10.5	5/2 10.0	6/20 9.8	8/1 9.5	8/7 9.0	8/19 8.5	9/7 9.0	10/7 9.1	11/13 9.4	12/3 9.7	12/16 9.1	12/19 9.5	12/26 9.2			9.2	4.0	4.5
Detroit, Mich.	3.5	11.6																	11.6	4.0	4.5
Duluth, Minn.	3.5	13.9																	13.9	5.0	4.5
Minneapolis, Minn.	3.0	13.0	1/5 12.5	6/15 11.5	8/9 12.7														12.7	5.0	4.5
Jackson, Miss.	4.0	13.5	1/17 13.0	8/27 11.5	8/29 12.5														12.5	7.0	7.5
Kansas City, Mo.	3.5	12.4	9/7 12.3	10/11 10.8															10.8	4.0	4.5
Helena, Mont.	4.0	18.5	2/23 16.5	4/24 14.0	7/25 13.0														13.0	6.0	6.5
Omaha, Neb.	3.0	10.5	2/3 9.9	3/4 10.5	4/20 9.5	5/1 10.9	5/8 11.4	7/1 11.9	7/12 *12.9										12.9	6.0	6.5
Reno, Nev.	4.0	16.5	5/28 15.0																15.0	5.0	5.5
Newark, N. J.	3.5	12.2	9/10 11.6																11.6	4.0	4.5
Albuquerque, N. M.	4.5	15.0	2/7 12.5	3/4 11.5	6/4 12.5	7/12 11.5													11.5	6.5	7.0
New York, N. Y.	2.0	10.7	3/19 10.3	5/1 9.8	6/20 9.5	7/6 9.2	8/28 9.0	9/25 8.7	10/7 8.8	10/12 8.4	10/22 8.8	10/29 8.9	10/31 8.5	12/10 9.0					9.0	5.0	5.5
Charlotte, N. C.	3.5	14.9	4/27 13.0	6/12 14.9	6/24 14.0	6/29 13.5	9/11 13.0	10/10 12.5	10/24 11.9	11/4 11.5	11/15 11.0	11/29 10.5							10.5	7.0	7.5
Fargo, N. D.	3.5	14.7																	14.7	5.0	5.5
Cleveland, Ohio	3.0	14.0																	14.0	4.0	4.5
Tulsa, Okla.	2.0	8.0	6/29 9.0																9.0	5.0	5.5
Portland, Ore.	4.0	15.0	5/28 13.5																13.5	6.0	6.5
Philadelphia, Pa.	2.0	11.0	3/5 10.5	3/14 9.8	3/25 10.5	9/12 10.0	11/27 10.0												10.0	5.0	5.5
Providence, R. I.	3.0	12.3	3/14 11.5	5/2 11.0	5/3 10.5	6/20 10.2	8/7 9.9	8/28 9.5	9/25 9.4	10/7 9.6	10/29 9.7	11/13 9.9	12/3 10.2	12/31 10.0					10.0	4.0	4.5
Charleston, S. C.	3.5	13.75	9/10 13.25	11/4 12.75															12.75	7.0	7.5
Huron, S. D.	3.5	14.0			3/25														14.0	5.0	5.5
Memphis, Tenn.	3.0	13.5	12.5																12.5	8.0	8.5
Dallas, Tex.	3.5	11.0	5/1 10.0																10.0	5.0	5.5
Salt Lake City, Utah	4.0	14.5																	14.5	5.0	5.5
Burlington, Vt.	3.5	13.5	3/14 13.1	4/8 12.9	5/1 12.4	6/20 12.0	8/7 11.7	8/28 11.5	9/25 11.1	12/3 11.0	12/13 10.8								10.8	5.0	5.5
Norfolk, Va.	3.5	13.75	9/10 13.25	11/4 12.75															12.75	6.0	6.5
Seattle, Wash.	4.0	15.0	5/28 13.5																13.5	6.0	6.5
Charleston, W. Va.	3.5	14.55	9/10 14.05	11/4 13.55															13.55	6.0	6.5
Milwaukee, Wis.	4.0	13.8	1/5 13.3																13.3	5.0	5.5
Casper, Wyo.	4.0	16.5	2/1 15.5	6/9 15.0															15.0	5.0	5.5
Average price	3.502	13.48																	12.21	5.4	5.9

*Dealer margin became 3.5 at Omaha Sept. 12, 1940.

Better Demand Presages Relief From Dismal Refinery Prices

By H. STANLEY NORMAN

RELIEF from the most protracted siege of depressed refinery prices in the recent experience of the petroleum industry is in prospect, but the 1940 record contains an unbroken chain of unsatisfactory aspects. The assurance by government economists and leaders of the industry that domestic gasoline consumption will increase from 6 to 9 per cent in 1941 and that fuel-oil demand will gain 10 per cent lays the predicate for substantial improvement.

The record of 1940 is particularly dismal for motor fuel. A general reduction of 7 per cent in the refinery price of gasoline was suffered by producers in the various districts outside the Gulf Coast where the depressed conditions were more acute.

The average price of regular gasoline on the Gulf Coast fell to 4.43 cents per gallon, but it was only by the aid of a relatively sound market through the earlier part of the year that this figure prevailed. The low of 3.5 cents per gallon obtained at the close of the year. The average for the second 6 months was down to 3.93 cents compared to 4.92 in the first half. Part of the decline can be attributed to reduced seasonal consumption, but the largest barriers to Gulf Coast trade existing most or all of the year were constriction of exports and abnormally high tanker rates.

With more than 40 per cent of the nation's refining capacity centered on the Gulf Coast, the lowest prices there in years worked a particular hardship on the nerve center of the industry's market.

Motor-fuel prices in other refining districts were reasonably static through the year except for the usual variations caused by seasonal conditions. There was a variation of only 0.5 cent per gallon in the high and low of Oklahoma Group 3 refinery prices for regular motor fuel during the entire year, compared to a swing of 2.5 cents on the Gulf Coast. The wide variation in Gulf Coast gasoline prices was reflected on the Atlantic seaboard market where there was a difference of 2 cents in the high and low. The eastern coastal markets are so definitely linked with the primary source of supply on the Gulf that the two move practically in unison. Depression of the refinery market may be visualized by the downward trend of all products in the second 6 months, excepting two out of a list of 41. The exceptions are natural gasoline and residual fuel oil in the Group 3 territory.

Residual fuel-oil prices were stiffening in other refining centers at the turn of the year on account of consumption by industries manufacturing defense materials. There is substantial evidence that the heavy-fuel-oil market will continue to improve with the price curve pointing upward through the middle or third quarter of this year. Spot prices for residual have moved up 10 cents per barrel or more in the interior market but the bulk of supplies comes from Gulf and Pacific coastal operators. Consequently, the inland price movements on residual fuel oils are not symbolic of general conditions in the industry. The advance of 10 cents per barrel in the East Coast contract prices for heavy fuels for delivery during the first 6 months is of greater significance than the similar increase in the Mid-Continent.

Natural-Gasoline Market

The natural-gasoline market east of the Rocky Mountains was unable to hold its 1939 pace in 1940. Oklahoma and Texas producers were forced to take 1.5 cents per gallon for their 26-70 natural gasoline from the latter part of March through the middle of August. The market rose to a high of 2.75 cents through most of October, but dropped back in the early part of November and closed the year at 2 cents in Texas and 2⅛ cents in Oklahoma.

Cost of transportation exerted an influence on marketing refinery products last year unprecedented in recent years. The high cost of open-market tankers hit a peak of 80 cents per barrel for Gulf-to-North Atlantic-port movement in December. Indications are that part of the depressed market for Gulf Coast products can be attributed to the tanker charges, at least to the extent that buyers withheld their normal placement of business until a break in rates occurred. Reduction of 15 cents per barrel in the charter market in the early part of January was considered by some observers indicative of a trend to more normal levels. Development of sentiment in Washington for an investigation of tanker rates had at least a moral bearing on the recession.

Fuel oils in general made the best market showing of all refinery products in 1940, both from a standpoint of relatively narrow fluctuations and from comparison with previous years. Failure of the distillate-fuel-oil market to make greater concession to the summer season can be traced back to the winter of 1939-40. Unusually severe and protracted subfreezing temperatures in January and February, 1940, drew stocks of distillate fuels so low that normal operations were impaired. Stocks of distillate fuel were built during the summer months to the highest figure in history, but there was not the customary insistence on moving these oils against the resistance of seasonal conditions. Refiners, on the contrary, provided storage that enabled them to hold larger stocks in reserve for the current winter trade. Prices on distillate fuel oil have moved up approximately 0.25 cent per gal-

AVERAGE YEARLY PRICES ON MOST IMPORTANT REFINERY PRODUCTS, 1931, TO JANUARY 1, 1941

(Prices in tank car at plant)

MID-CONTINENT, BASIS OKLAHOMA (GROUP 3)

	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Regular gasoline (72-74 octane), per gallon	$.0451	$.0487	$.0503	$.0582	$.0588	$.0492	$.0444	$.0363	$.0392	$.0345
Natural gasoline, 26-70 (AA grade) per gallon	.0197	.0317	.0271	.0367	.0361	.0320	.0260	.0290	.0222	.0301
41-43 water-white kerosene, per gallon	.0382	.0367	.0407	.0413	.0365	.0353	.0322	.0279	.0315	.0231
Fuel oil, 8 to 14 gravity, per barrel	.4875	.4597	.5509	.7780	.6619	.6232	.5930	.3899	.3250	.2904
U.G.I. gas oil, per gallon	.0269	.0267	.0208	.0289	.0251	.0233	.0201	.0146	.0146	.0127
200 vis. neutral, 3 color (10-25 pour point), per gallon	.1049	.11	.1000	.0996	.1043	.1075	.0994	.0845	.0834	.0924
150-160 D color bright stock (10-25 pour), per gallon	.1787	.1674	.1491	.1859	.1769	.1496	.2030	.1852	.1837	.1631
124-126 wax, per pound	.0406	.0350	.0230	.0286	.0245	.0224	.0346	.0253	.0170	.0174
Crude (36 A.P.I. gravity), per barrel	1.02	1.02	1.19	1.21	1.10	1.00	1.00	.62	.88	.63

CALIFORNIA

	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Regular gasoline (72-74 octane), per gallon	$.0636	$.0621	$.0677	$.0737	$.0602	$.0552	$.0624	$.0523	$.0546	$.0510
Natural gasoline, 75-85 375 end point, per gallon	.0516	.0598	.0639	.0676	.0617	.0506	.0575	.0462	.0447	.0418
38-43 kerosene, per gallon	.0450	.0473	.0510	.0432	.0339	.0409	.0458	.0384	.0398	.0425
27 plus diesel*	1.13	.9466	1.19	1.175	1.035	1.084	1.032	.8406	.7432	.7510
Crude (25 A.P.I. gravity, Signal Hill), per barrel	.96	1.03	1.03	1.03	.997	.85	.94	.84	.83	.76

PENNSYLVANIA

	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Regular gasoline (74-76 octane), per gallon†	$.0608	$.0453	$.0487	$.0544	$.0565	$.0521	$.0519	$.0505	$.0568	$.049
45 water-white kerosene, per gallon	.0485	.0485	.0501	.0507	.0504	.0467	.0448	.0446	.0451	.04
Bright stock, 10-15 pour point, per gallon	.2053	.2079	.1671	.2422	.2361	.1990	.2540	.2407	.2466	.2094
Crude in National Transit Lines (Bradford field), per barrel	2.33	2.06	1.89	2.64	1.42	2.17	2.47	1.86	1.88	1.81

*1936, 1937, 1938, and 1939 prices are on 24 plus diesel. †Previous to 1940 below 60 octane.

lon in most refining districts outside the Gulf Coast, but evidence is growing that consumption this winter may not justify the preparation for more abundant demand. The relatively insignificant declines in stocks of distillate fuel oil so far have prevented greater demarcation between summer and winter tank-car prices.

The temporary war boom in export demand for lubricating oils which pushed Pennsylvania neutrals and bright stocks to history-making peaks in the first part of January was followed by a rapid series of price reductions through the first half of 1940. After the series of reductions which lowered 200-viscosity Pennsylvania neutral from 34 to 23.5 cents, the market stiffened and held steady during the last half. Bright stocks followed the general market lines of neutrals falling from a peak of 35 cents per gallon for 10-pour-point material at the start of the year to the closing price of 14.5 cents which was relatively static in the second 6 months.

Increasing domestic demand, partly due to greater industrial activity, had taken up most of the slack from dwindling exports at the end of the year. Pennsylvania crude producers received two price increases in the second 6 months which establish a significant base for an advance in lubricating oils. Pennsylvania refiners report a strong demand for lubricating oils from domestic consumers. Tank-car prices may soon move forward.

(Continued on Page 76)

AVERAGE DOMESTIC AND EXPORT REFINERY PRICES DURING PAST THREE YEARS

(QUOTATIONS F.O.B. PLANTS AND TERMINALS)

	1940					1939					1938				
GASOLINES—															
Oklahoma (Group 3):	Av. pr.			1st	2nd	Av. pr.			1st	2nd	Av. pr.			1st	2nd
U. S. Motor grades:	for yr.	High	Low	6 mos.	6 mos.	for yr.	High	Low	6 mos.	6 mos.	for yr.	High	Low	6 mos.	6 mos.
Regular, 72-74 octane	$.0451	$.0475	$.0425	$.0451	$.0450	$.0487	$.0525	$.0438	$.0464	$.0510	$.0503	$.0550	$.0437	$.0510	$.0496
Third grade, below 62 octane	.0374	.0388	.0325	.0387	.0360	.0405	.0450	.0325	.0377	.0433	.0415	.0475	.0437	.0417	.0414
Pennsylvania:															
74-76 (regular)*	.0608	.0663	.06	.0616	.06	.0453	.05	.0425	.0438	.0468	.0487	.0525	.0425	.0488	.0486
California:															
58-60 400; 72-74 octane†	.0636	.07	.0550	.0694	.0578	.0621	.0650	.06	.0619	.0623	.0677	.0750	.0650	.0690	.0664
New York (Bayonne, N. J.):															
72-74 octane	.0581	.0650	.0450	.0620	.0541	.0618	.0650	.06	.0608	.0627	.0666	.0712	.0650	.0673	.0658
Gulf Coast (domestic):															
Regular, 72-74 octane‡	.0443	.06	.0350	.0492	.0393	.0526	.0650	.0512	.0472	.0579	.0523	.0550	.0462	.0549	.0498
NATURAL GASOLINES—															
Oklahoma (Group 3):															
Grade 26-70	.0197	.0275	.0150	.0178	.0216	.0317	.0425	.0250	.0265	.0368	.0271	.0375	.02	.0236	.0305
Grade 18-55	.0223	.0325	.0150	.0210	.0235	.0376	.0512	.0275	.0315	.0436	.0317	.0437	.0237	.0280	.0353
California:															
75-85 375-390	.0516	.0575	.0450	.0567	.0464	.0598	.0650	.0550	.0630	.0566	.0639	.0675	.0625	.0650	.0627
KEROSENE—															
Oklahoma (Group 3):															
41-43 water white	.0382	.04	.0363	.0384	.0379	.0367	.0388	.0337	.0378	.0356	.0407	.0425	.0387	.0415	.0398
Pennsylvania:															
45 water white	.0485	.05	.0450	.0489	.0481	.0485	.05	.0450	.0489	.0481	.0501	.0550	.0462	.0517	.0485
California:															
38-43 high-burning test	.0450	.0450	.0450	.0450	.0450	.0473	.0475	.0450	.0475	.0471	.0510	.06	.0475	.0530	.0490
New York (Bayonne, N. J.):															
41-43 water white	.0536	.0590	.0480	.0568	.0503	.0460	.0520	.0437	.0450	.0469	.0515	.0630	.0462	.0567	.0462
Gulf Coast:															
41-43 water white	.0424	.0450	.0375	.0450	.0397	.0391	.0450	.0350	.0370	.0411	.0428	.05	.0387	.0461	.0395
FURNACE OILS AND TRACTOR FUELS—															
Oklahoma (Group 3):															
38-42, No. 1 prime white	.0353	.0375	.0325	.0363	.0343	.0336	.0363	.0312	.0340	.0331	.0381	.0412	.0362	.0390	.0373
38-40, No. 1 straw	.0343	.0363	.0338	.0352	.0333	.0322	.0350	.03	.0327	.0317	.0368	.04	.0350	.0377	.0359
32-36, No. 2 straw	.0334	.0350	.0325	.0339	.0328	.0303	.0338	.0275	.0304	.0302	.0350	.0387	.0300	.0351	.0349
New York (Bayonne, N. J.):															
No. 1	.0534	.0590	.0480	.0564	.0503	.0441	.05	.04	.0435	.0446	.0514	.0630	.0450	.0578	.0450
No. 4	.0470	.0540	.0410	.0508	.0431	.0397	.0425	.0375	.0397	.0396	.0439	.0525	.04	.0478	.04
GAS OIL, DIESEL OIL, AND FUEL OIL—															
Oklahoma (Group 3):															
U.G.I. gas oil, under 35	.0269	.0313	.0263	.0263	.0274	.0267	.0288	.0250	.0271	.0262	.0280	.0287	.0262	.0275	.0285
No. 6 fuel oil, industrial, 8-14	.4875	.50	.45	.4750	.50	.4597	.5250	.40	.4654	.4540	.5509	.70	.50	.5961	.5058
California:															
27 plus diesel, per barrel	1.13	1.15	1.10	1.15	1.10	.9466	1.15	.80	.97	.9231	1.19	1.50	1.00	1.32	1.05
New York (Bayonne, N. J.):															
28-30 diesel (lighterage 6¼ cents bbl.)	1.93	2.20	1.70	2.07	1.79	1.695	2.10	1.65	1.67	1.72	1.84	2.20	1.75	1.93	1.75
Bunker C (New York Harbor)	1.34	1.50	1.15	1.47	1.20	1.04	1.50	.95	.96	1.12	1.05	1.25	.95	1.14	.95
NEUTRAL OILS—															
Oklahoma (Group 3):															
200, 3 color, 10-25 pour point	.1049	.14	.08	.1260	.0837	.11	.14	.10	.10	.12	.10	.10	.10	.10	.10
Pennsylvania:															
200, 3 color, 10 pour point	.2588	.34	.2350	.2825	.2350	.2208	.34	.17	.1810	.2606	.1714	.20	.1350	.1784	.1644
Gulf Coast:															
200, 3 pale oil	.0720	.0725	.0713	.0725	.0715	.0699	.0725	.0650	.07	.0697	.0700	.07	.07	.0700	.0700
200, 5-6 red oil	.0695	.07	.0688	.07	.0690	.0711	.0725	.0625	.0725	.0697	.0719	.0725	.0725	.0725	.0712
California:															
200, 2½-3 pale oil	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0725	.0719	.0750	.0725	.0725	.0712
BRIGHT AND STEAM-REFINED STOCKS—															
Oklahoma (Group 3):															
150-160, zero to 10, D color	.1787	.25	.1350	.2192	.1382	.1674	.25	.1425	.1425	.1922	.1461	.16	.1425	.1554	.1428
Pennsylvania:															
600 S.R.	.1056	.18	.07	.1386	.0725	.0996	.1750	.08	.0831	.1161	.0815	.0850	.07	.0827	.0803
Bright stock, 10 pour point	.2053	.35	.1450	.2620	.1485	.2079	.35	.15	.1733	.2425	.1671	.1850	.15	.1721	.1621
WAX—															
Oklahoma (Group 3):															
124-126 (crude scale)	.0406	.0675	.0250	.0537	.0274	.0350	.0675	.0235	.0256	.0444	.0230	.03	.0212	.0234	.0226
New York (Bayonne, N. J.):															
125-127 (A.m.p.)	.0590	.0675	.0560	.0617	.0562	.0419	.0650	.0360	.0367	.0470	.0431	.0455	.0435	.0441	.0421
EXPORT PRICES—															
Gasoline—Gulf Coast:															
60-62 400	.0429	.0513	.0363	.0479	.0378	.0449	.05	.0425	.0428	.0469	.0481	.0537	.0437	.0482	.0470
64-66 375	.0447	.0575	.0388	.0502	.0391	.0530	.07	.04	.0437	.0622	.0510	.0575	.0450	.0522	.0498
Los Angeles, Calif.:															
U. S. Motor, 60-65 octane	.0517	.0550	.0450	.0545	.0488	.0468	.0550	.0425	.0458	.0477	.0521	.0575	.0500	.0539	.0502
U. S. Motor, 65-69 octane	.0563	.0575	.0525	.0575	.0550	.0495	.0575	.0450	.0483	.0507	.0559	.0625	.0525	.0589	.0529
Lubricants—New York (f.a.s. in bbl.):															
600 S.R. unfiltered	.1832	.25	.1550	.2060	.1603	.1842	.28	.16	.16	.2084	.1607	.1650	.1550	.1613	.16
Bright stock: 25 pour point	.2730	.40	.20	.3340	.2120	.2324	.40	.1625	.1625	.3022	.1914	.2350	.1625	.2203	.1625

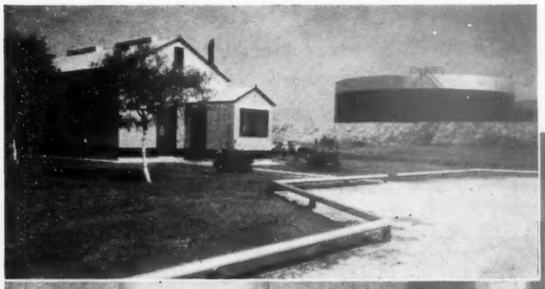
*Below 60 octane, 1939 and 1938. †54-58 gravity (65 octane and higher), 1939 and 1938. ‡68-70 octane, 1939 and 1938.

Pipe-Line Industry Planning Large Projects for 1941

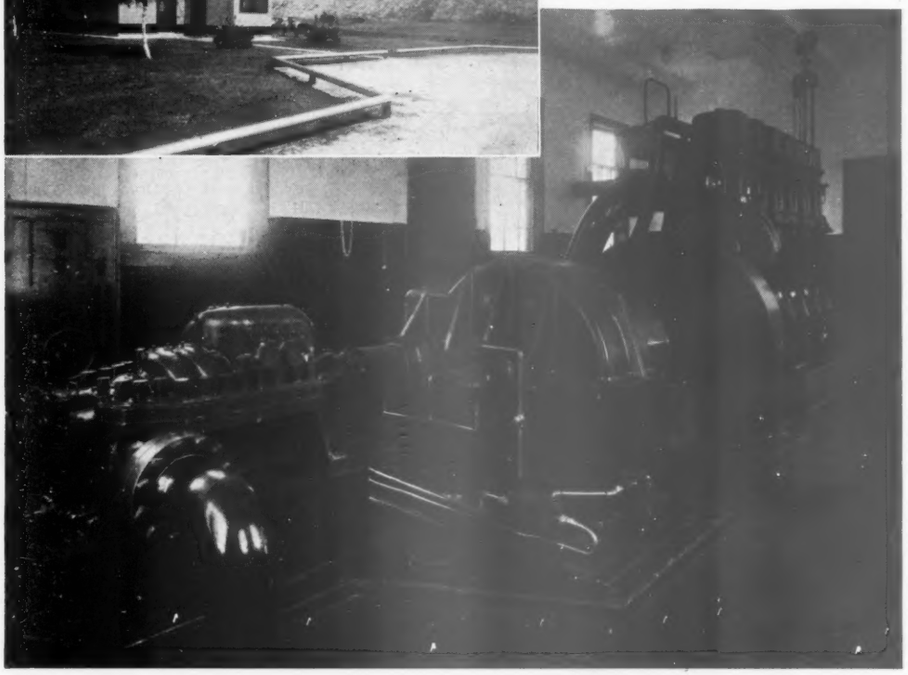
By PAUL REED

Unprecedented pipe-line expansion forecast last spring has been substantiated by construction work done in 1940, exceeding that of preceding years, and by projects of even greater magnitude planned by important companies for early construction.

JUDGING from preparations for pipe-line construction in 1941, it appears that more large projects are being planned now than have been observed at the beginning of any other year in the history of the industry. Among these are two projects which individually call for longer lines than have ever been laid in the course of 1 year as single undertakings. A review of the situation shows that projects, now being seriously considered by companies with adequate financial resources, represent a total length of close to 6,000 miles, which is nearly equal to the total mileage of all lines of any considerable length which were laid in 1940. Important pipe-line construction in preceding years amounted to 5,000 miles in 1939, 2,500 miles in 1938, and 2,000 miles in 1937.



Pumping station, left, built by Continental Pipe Line Co. at San Diego, Tex., to serve system in the Corpus Christi area, recently expanded to 404 miles



Interior view of pumping station shows 485-hp. railcar-type diesel engine, operating at 450 r.p.m., driving a 4 by 6, six-stage centrifugal pump at 3,600 r.p.m. The unit pumps 22,000 bbl. at 900-lb. pressure under normal conditions. The station handles five grades of crude varying between 21° and 45° A.P.I.

This program of expansion is going forward in the face of an unprecedented number of legal obstacles of various kinds which impede pipe-line programs, in spite of the general public recognition that pipe lines are vital for national defense and national efficiency.

With the beginning of 1941 comes the completion of two important crude-oil pipe lines which were started late in 1940; these are the Pan American 200-mile line from East Texas to the Gulf Coast, and the Stanolind 165-mile line from La Plata, Mo., to Wood River, Ill. With the exception of these projects now being finished, no major projects are now under construction in this country.

In the early months of 1940 a considerable amount of line was laid by the Texas-Empire and Sohio organizations to enlarge outlets for the Illinois oil fields. Northern Natural, Panhandle Eastern, and Manufacturers Light & Heat interests expanded facilities by looping and doubling lines already laid. Construction of new gasoline lines is significant; Magnolia placed in operation three gasoline lines in the Southwest; Shell converted a crude-oil line to gasoline-line service across Illinois and extended a gasoline line in Ohio. In northern states major companies have been engaged in laying gasoline lines in New York, Connecticut, and Massachusetts.

Much attention was directed to the difficulties encountered by Southeastern Pipe Line Co., a Gulf and Pure subsidiary, due to withholding of permits to cross under railroads and highways during the construction of a 450-mile gasoline project in Florida and Georgia. This is partially completed. A section between Bainbridge, Ga., and Port St. Joe, Fla., less than 100 miles long, was placed in operation late in December. Considerable construction of crude-oil lines was carried on in the laying of different projects in West Texas and the Texas Gulf Coast areas by the Magnolia, Texas-New Mexico, Basin, and Continental companies.

Toward the close of the year the industry witnessed innovations in crude-oil transportation in the form of two pipe-line hookups. One provides for moving Venezuela crude across the United States from Philadelphia to Sarnia, Canada, for Standard of New Jersey interests. The other transmits Oklahoma crude from Tulsa to Philadelphia for Gulf.

Illinois Decline Poses Problems

Two pipe-line situations exist in the North Central states which compel attention because of their bearing on new construction. In the first place, as the Illinois fields continue to decline there will be an increased demand for facilities to move crude from the Mid-Continent to refineries in the vicinity of Chicago and St. Louis. In the second place, the expansion of gasoline pipe lines in this area by Phillips and Shell affects distribution practices and it is logical to expect construction of new gasoline pipe-line systems in this area.

A program for the construction of both crude-oil and gasoline lines is planned by a major organization, regarding which no public announcement has been made. There are indications that this program will definitely get under way some time in the spring. Extensive repair work is now being carried on at sections of a system extending from the Mid-Continent to northern points; looping of the system is planned. Preliminary steps are being taken to provide for the laying of four gasoline lines totaling several hundred miles which will deliver refined products at distributing points in certain areas in the region between South Dakota and Central Indiana. Furthermore, it is reported that this program will lead to competitive gasoline-pipe-line building on the part of other interests.

The building of natural-gas pipe-line facilities to serve Milwaukee and other parts of Wisconsin has been considered at the hearings conducted by Federal Power Commission to consider applications of Western Natural Gas Co. (El Paso) and Independent Natural Gas Co. (Phillips) for laying lines to transmit gas from the Texas Panhandle

(Continued on Page 74)

One Sure Way . . .

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OPERATORS both large and small, in increasing numbers, are seeing for themselves that there is no adequate substitute for a careful, scientific analysis of cores made at the well as coring progresses. Only in this way can the operator be assured of reliable and prompt (usually within 3 hours) information upon which to make his decisions regarding completion, production and evaluation problems.

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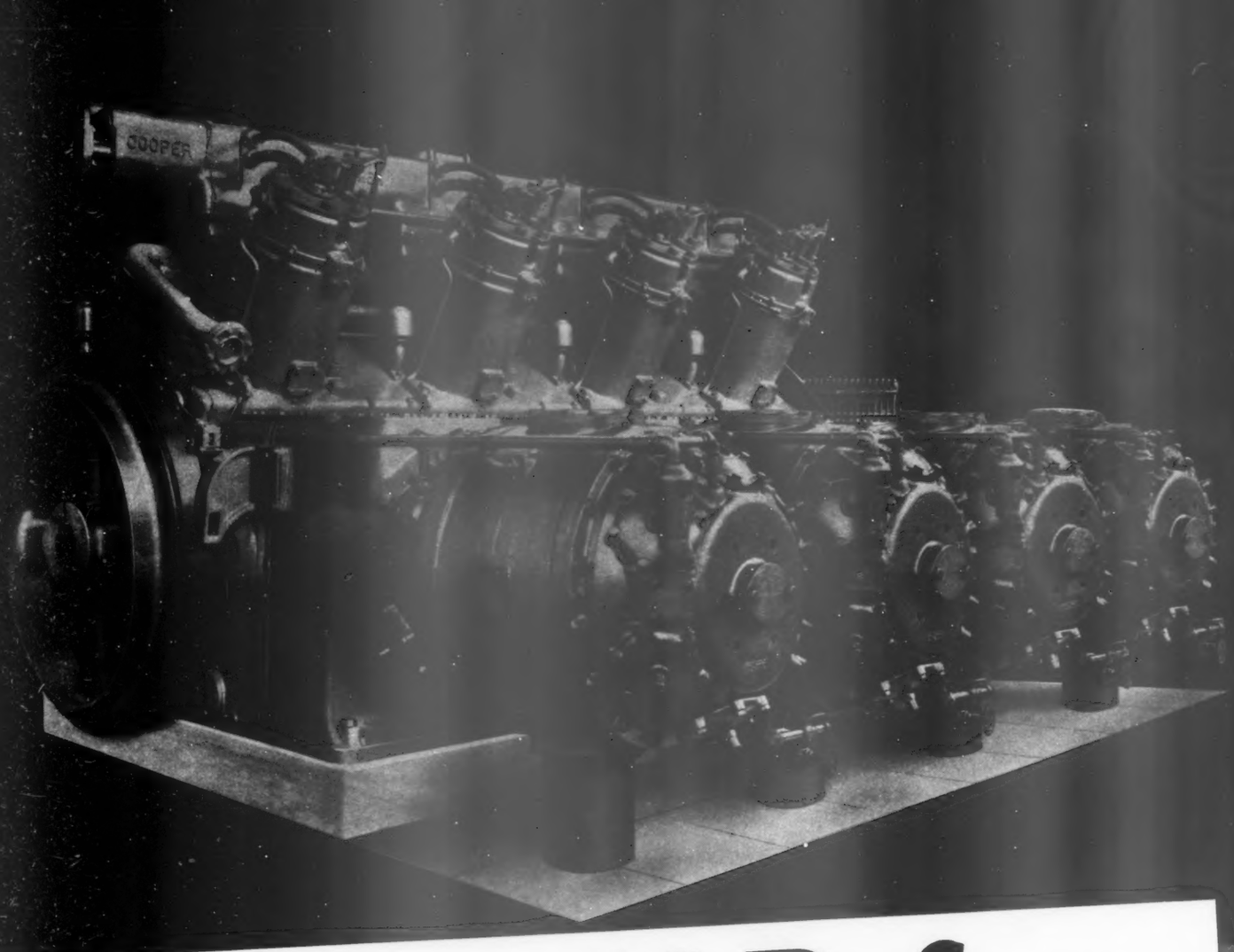

13,000 HP for

Toughest test of any compressor unit is its ability to serve 365 days a year on main-line gas transmission . . . without failure, with little or no maintenance cost, and at low operating expense.

Cooper-Bessemer "horizontals" have met that test for ten years in Southern Natural Gas Company stations . . . and modern G-MV-angles have passed it with flying colors for more than a year!

Logical was "Southern Natural's" REPEAT order for both types . . . 13,000 C-B horsepower bought in 1940 . . . outstanding gas pipe-line compressor order for the year!

For your 1941 expansion program, make it PROVEN Cooper-Bessemer compressors.

THE COOPER-BESSEMER CORPORATION

Mount Vernon, Ohio — PLANTS — Grove City, Penna.

"Southern Natural"

Top, Left — Cooper-Bessemer V-angles are two-cycle, compact, amazingly reliable, efficient, and economical. Their field-proved records in continuous main-line compressor-station service are your assurance that these are the best "angles" built today — for *any* exacting service you can name.

Above, Right — Cooper-Bessemer horizontals are four-cycle, slow-speed, and heavy-duty. Thousands and thousands of horsepower are in constant service on many of the famous gas-transmission lines of this country. They set the all-time standards for long life, dependability, and economy over a period of years.

These two-cycle and four-cycle C-B compressor units made such a hit with Southern Natural Gas Company that they came back for more of both!

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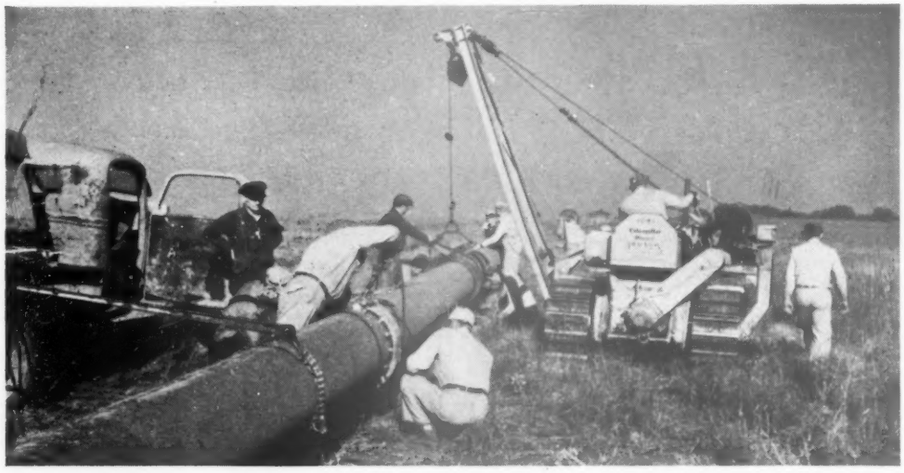
(Continued from Page 70)

and the Hugoton, Kans., areas. The status of these projects cannot be determined until a decision is handed down. Natural Gas Pipeline Co. of America is also concerned with this pipe-line situation. Construction of a lateral by this company from the main line to Milwaukee has been stopped near the Wisconsin State line by state authorities. This company has been considering plans for extensive pipe-line construction to enlarge trunk-line facilities.

The longest gasoline pipe line now being planned is that of Plantation Pipe Line Co., owned by Standard of New Jersey and Shell interests, which is to transport refined products from Baton Rouge, La., to Portsmouth, Va., a distance of more than 1,200 miles. In order to expedite construction operations later on, considerable time is now being given to the study of problems connected with the project.

Of all the lines being contemplated, the longest and most expensive to build is that of Reserve Pipe Line Co. for the transmission of natural gas from the Corpus Christi, Tex., area to New York City. Arrangements have been made for financing the line and contracts have been made with gas producers. In this case, as well as in that of Tennessee Gas & Transmission Co.'s proposal to lay a line from Louisiana to eastern Tennessee and North Carolina, construction cannot be undertaken until permits are issued by F.P.C.



Lining up and tacking 20-in. pipe during the construction of the lateral extending from Geneseo compressor station toward Milwaukee for Natural Gas Pipeline Co. of America. H. C. Price Co. handled the welding for the two contractors, engaged in laying the line, Dempsey-Wilson Construction Co. and I. C. Little

Other Important Work

Other work of importance in prospect is the extensive looping of major gas trunk lines running north from the Texas Panhandle. There have been no recent announcements to indicate activity of the proposed project to transmit gas from Hugoton area to the Minnesota iron ranges.

In foreign countries more pipe-line work is contemplated than usual. The Argentine Government has arranged with the United States for credits, part of which, it is reported, will be used for a 550-mile crude-oil line in the western part of Argentina. The Government of Bolivia has applied to the United States for a loan to build an 800-mile crude-oil line. Soviet Russia has contracted with six American steel companies for 170 miles of 12¾-in. pipe for a crude-oil line in the Ural Mountains. It has been announced that in connection with the program of the German Government approximately 375 miles of crude-oil pipe line are planned for Rumania.

In making plans for the laying of large-diameter pipe during the months ahead, considerable attention is being given to improving welding clamp equipment used in operations of this kind. It is important that a quick accurate tool be provided for this purpose. A major company planning extensive construction work this year has planned demonstrations of improved welding clamp equipment in order that contractors may become familiar with the advantages which it will make possible. It is expected that such demonstrations will be beneficial in figuring bids.

The far-reaching effect of gasoline pipe lines on the operations of the petroleum industry are becoming more apparent each year. The modern welded line provides a tight container for refined products which eliminates the need of allowing for losses due to leakage and evaporation under the normal conditions. Where sufficient volume may be handled, pipe lines provide safe and economical transportation for long as well as short distances. Although the gasoline lines now in operation represent only a fraction of the mileage in crude-oil systems, there are indications that gasoline lines will have an influence on future developments, since they make it possible for refineries, located near important producing areas, to reap the advantages characteristic of situations of this kind. Furthermore, gasoline lines facilitate programs for the storage of refined products near points of distribution.

A review of pipe-line plans indicates that in 1941 much work may be done in Nebraska, Iowa, Wisconsin, and Indiana as well as in the southeastern states. According to the experience of previous years, the amount of new construction work in sight at the beginning of the year is usually just a fraction of what is eventually laid in the following 12 months. Announcements for most of the construction projects are made in the spring and summer.

To say that the industry has prospects of an active year is putting it mildly. With more than 6,000 miles of major projects in sight, including those announced and those not yet publicly announced, it is quite possible that, barring unforeseen events, an estimate of 10,000 miles of line for 1941 is conservative.

1940 PIPE-LINE PROJECTS MORE THAN 100 MILES

Crude-Oil Lines

Sohio Pipe Line Co., 240 miles of 12-in. from Stoy, Ill., to Lima, Ohio, and other projects which altogether represent a total mileage of 350 miles.

Illinois Pipe Line Co., 57 miles of 8 and 10-in. from Bridgeport to Enfield, Ill., and 40 miles of 10-in. from Martinsville to Brownstown, Ill.

Stanolind Pipe Line Co., 135 miles of 10-in. from Bemis field in western Kansas to Washington, Kans.

Stanolind Pipe Line Co., 180 miles of 12-in. from La Plata, Mo., to Wood River, Ill.

Basin Pipe Line Co., Cosden, 93 miles of 6-in. from Wasson field to Big Spring, Tex., and gathering-system lines making a total mileage of 112 miles.

Texas-New Mexico Pipe Line Co., 105 miles of 8, 10, and 14-in. from Slaughter field to Crane, Tex., and 15 miles of 4-in. from Artesia to Maljamar field, making a total of 125 miles.

Continental Pipe Lines Co., 165 miles of 4, 5, 6, and 8-in. lines in the vicinity of San Diego and Corpus Christi, Tex.

Pan American Pipe Line Co., 200 miles of 12-in. between East Texas and Gulf Coast and gathering lines in East Texas.

Magnolia Pipe Line Co., 100 miles of 8-in. in two lines in West Texas; Duggan-Slaughter area to Seminole; Seagraves to Midland.

Gasoline Pipe Lines

Southeastern Pipe Line Co. (Gulf and Pure interests), 450 miles of 6 and 8-in. from Port St. Joe, Fla., to Chattanooga, Tenn.

Magnolia Pipe Line Co., 139 miles of 4 and 6-in. from Corpus Christi to San Antonio, Tex.

Magnolia Pipe Line Co., 200 miles of 4½-in. from Fort Worth, Tex., to Oklahoma City, Okla.

Socony-Vacuum Oil Co., Inc., 171 miles of 4 and 6-in. from Buffalo to Syracuse, N. Y.

Shell Oil Co., Inc., 106 miles of 6-in. from Lima to Columbus, Ohio.

Texas Co. (formerly known as Lawrence Pipe Line Co.), 68 miles of 6-in. from Lawrenceville, Ill., to Evansville, Ind.

In addition, mention should be made of Magnolia Pipe Line Co.'s line consisting of 182 miles of 4, 5, and 6-in. from Kilgore to Beaumont, Tex., which was put in operation shortly before the beginning of the year for the transportation of natural gasoline and butanes.

Natural-Gas Lines

Panhandle Eastern Pipe Line Co., 242 miles of 20, 22, and 24-in. (loops) in Kansas, Missouri, and Illinois.

Northern Natural Gas Co., 109 miles of 24-in. and smaller pipe (loops), in Kansas, Nebraska, and Iowa.

Natural Gas Pipeline Co. of America, 162 miles of 20-in. from Geneseo, Ill., to Milwaukee, Wis.

Manufacturers Light & Heat Co., Manufacturers Gas Co., Pennsylvania Fuel Supply Co., 140 miles of 8 and 10-in. between Monaca and New York State line near Olean, N. Y.

Montana-Dakota Utilities Co., 170 miles of 3 and 8-in. from Glasgow to Glendive, Mont.

Northern Pipe Line Co., 100 miles of 4, 6, and 8-in. from Casper, Wyo., to Billy Creek field.

PROPOSED PROJECTS WHICH HAVE BEEN ANNOUNCED

Crude-Oil Lines

Yacimientos Petroliferos Fiscales, Argentine Government, 550 miles of 12-in. from Lulunta and Tupungato fields to Rio Parana, Argentina.

Gasoline Pipe Lines

Plantation Pipe Line Co., Standard Oil Co. of

For you and U. S. A.

Year by year demands for motor fuel have grown and quality standards have gone up

Year by year Universal has kept ahead of them through untiring research, invention and development

Year by year, opportunity for refiners has broadened as better methods to produce greater values from a barrel of crude were developed and made available to all

Now, as always, U. O. P. is ready Efficiently, speedily and abundantly new processes will make special defense products, superoctane fuel for fighting airplanes, butadiene to produce better rubber than trees ever grew, toluene, vital ingredient of TNT, and floods of motor gasoline and fuel oil needed by our defense forces and the industrial machine behind them

All these processes are available to all American refiners through Universal

Where do you fit in the picture?

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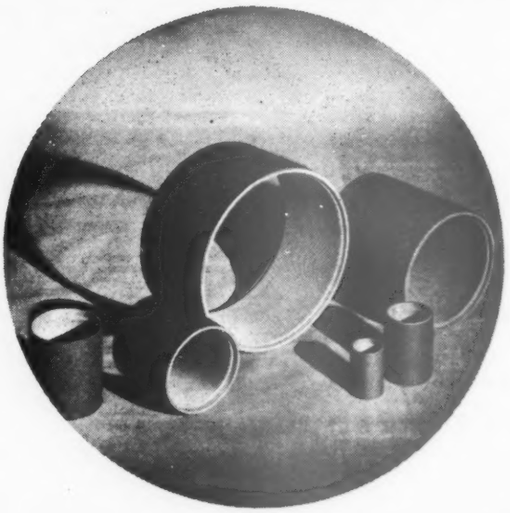
Precision



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Harrisburg Seamless Steel Couplings are actually "precision-made" because, first, Harrisburg Couplings are manufactured only from well-cropped prime steel possessing definite chemical and physical properties which research has shown to be essential to strength and durability in couplings. Second, threads are machined by an exclusive process, pioneered by Harrisburg. They are strip-proof and unsurpassed for uniform accuracy of form, height, angle and lead.

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Harrisburg makes: Alloy and carbon steels, seamless steel cylinders, pipe couplings, pump liners, liquefiers, hollow and drop forgings, pipe flanges, bull plugs and coils and bends

New Jersey, Standard Oil Co. of Kentucky, Shell Oil Co., Inc., 1,200 miles of 8 and 12-in. from Baton Rouge, La., to Portsmouth, Va.

Natural-Gas Lines

Reserve Gas Pipe Line Co., 1,500 miles of 24-in. from Texas to New York City.

Tennessee Gas & Transmission Co., 400 miles from North Louisiana to eastern Tennessee and North Carolina.

Kansas Pipe Line & Gas Co., 1,040 miles of 16-in. from Hugoton, Kans., to Mesabia iron range in Minnesota.

Western Natural Gas Co., 770 miles from Panhandle to Milwaukee, Wis.

Independent Natural Gas Co. (Phillips Petroleum Co.), 877 miles of 22-in. from Panhandle to Milwaukee, Wis.

Consumers Power Co., 60 miles of 12-in. from Missaukee, Osceola, and Clare pools to the main line at Midland, Mich.

●

Better Demand Presages Relief From Dismal Refinery Prices

(Continued from Page 69)

Western Pennsylvania refiners enjoyed a relatively strong market for motor fuel during the last 6 months of the year. There were three particular reasons why the Pennsylvania gasoline market did not follow its usual decline at the start of winter. One is the more general installation of equipment to produce a better quality of motor fuel, extending market acceptance. Another is the relief of competition from Illinois where independent refiners are meeting difficulty in obtaining their crude requirements at price concessions which prevailed when production from that state was climbing weekly. The third reason, common to other parts of the country as well, is the higher overall consumption of motor fuel.

Two barriers of domestic origin to maintenance of steady refinery prices appeared particularly formidable on the Pacific Coast. One was the dissolution of the commercial agreement with Japan which raised the sales resistance of that customer, and later the president included aviation gasoline and motor lubricants in the list of materials covered by export-license control.

The California market for light fuel oils is relatively steady. Heavy fuels suffered substantially from the reduction in trade with Japan since they made up a good percentage of the business. Resistance of the United States to trade with Japan turned the latter country to the Netherlands East Indies for a greater portion of her requirements.

The export-license control theoretically exerted almost equal influence on the Gulf Coast as on California. The difference was that war in Europe prevented Gulf Coast refiners from maintaining trade with previous customers. Thus, the decline of approximately 30 per cent in export business last year hit with particular force on the Gulf.

A comparatively new development in marketing and confined so far largely to the states of Texas and Louisiana threatens to exert an increasingly strong impact on refinery gasoline. The production of condensate from recycling plants in Texas and Louisiana totaled approximately 25,000 bbl. daily at the end of the year. Additional recycling plants under construction and projected will increase the present total by a substantial margin this year. The condensate production from some plants moves in direct competition with refinery gasoline at prices that are pressing downward on the market structure.

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LIQUID LEVEL GAGES

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Transparent
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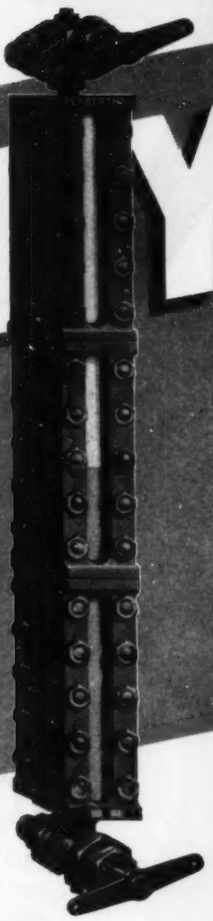

PENBERTHY LIQUID LEVEL GAGES *meet your requirements*

Liquid shows black—empty space shows white. Preferred wherever liquid level must be easily and positively visible . . . and where liquids are under high pressure or at high temperature.

All Penberthy Gages conform with A. P. I.—A. S. M. E. requirements.

Used to observe color and density of liquids under high pressures, and/or temperatures. Construction is exceptionally rugged . . . similar to Reflex types.

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Water shows black—steam shows white. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler.

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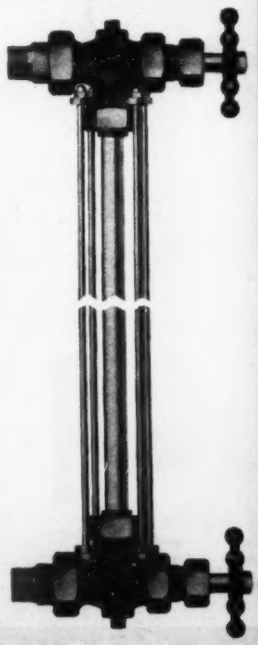

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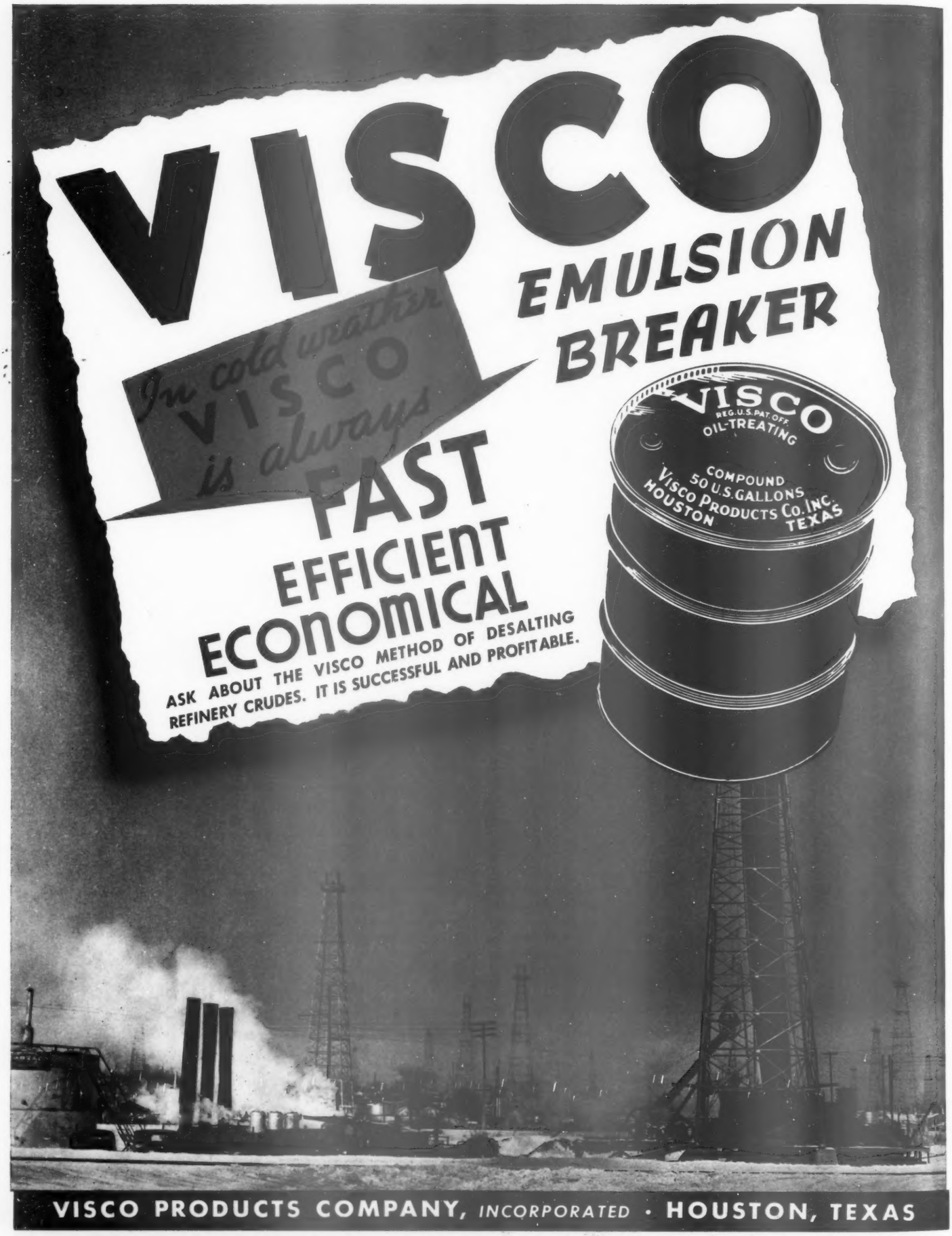

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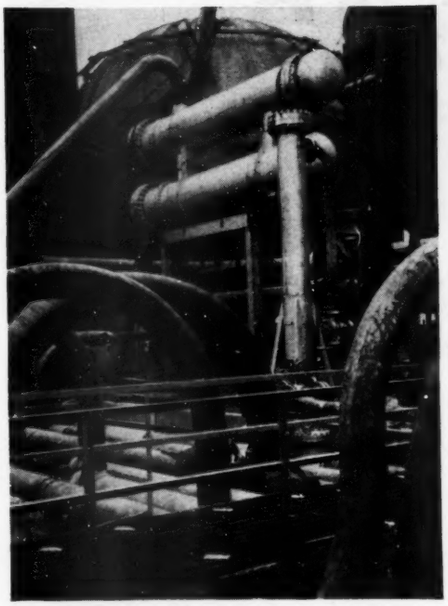
Natural Gas Industry Sets New Record for Expansion in 1940

By H. STANLEY NORMAN

PRODUCTION, sales and revenue of the natural-gas industry all set new-high records in 1940, a year which was also marked by at least one of the most important engineering achievements in the history of the business. All classes of consumption, except that for generation of electrical power, registered substantial gains. Domestic and industrial consumption, which together account for approximately 71 per cent of the total, increased 12.4 and 9.9 per cent, respectively. Commercial consumption increased 12.5 per cent for the year but the total volume of 122,987,000,000 cu. ft. is still relatively unimportant in the total figure of 1,444,663,000,000 cu. ft.

The outstanding engineering achievement of the year was the installation in Cleveland, Ohio, of a new plant which reduces natural gas to a liquid state at a temperature of 250° below zero. Liquid gas is stored in special containers from which it is later withdrawn in its original form and fed into distribution mains. Some of the advantages foreseen in this novel type of plant are a substantial saving in storage facilities, the ready availability of a gas supply in case of emergencies, and the ability to maintain uninterrupted service during severe peak demands. The new plant has incited much interest not alone within the gas industry, but in the engineering and chemical professions as well.

Features of the Cleveland plant built for East Ohio Gas Co. include installations for liquefaction of the natural gas by means of refrigeration and compression, spheres for storing the liquid which are insulated with 3 ft. of cork, and the pumping and regasification equipment. Two reviews of the liquefaction development were printed by The Oil and Gas Journal in 1940. One, by W. V. Howard, was published on Page 18, May 9, and the other, by J. A. Clark, chief engineer, and R. W. Miller, research director, Hope Natural Gas Co., started on Page 48 of the October 17 issue. The commercial-scale plant at Cleveland was an outgrowth of experimental work conducted largely in a pilot plant of Hope Natural Gas Co. at Cornwell station, Corton, W. Va.



Condensers, exchangers, compressor piping and storage spheres for natural-gas liquefaction and regasification

Total Production

Preliminary estimates of the American Gas Association indicate that the total production of natural gas in 1940, including amounts used in the manufacture of carbon black and for field purposes, reached a total of 2,600,000,000,000 cu. ft., an increase of approximately 18 per cent over 1939. Approximately 182,546,000,000 cu. ft. of natural gas were consumed during the year in generation of electrical energy which was a decline of 4.6 per cent compared to 1939. An increase of 9.9 per cent in other industrial consumption of natural gas more than offset the reduction in use for electric generation. The combined consumption by industrial and electric-generation customers increased 6.7 per cent.

Domestic customers increased to 7,140,500, a gain of 3.9 per cent. From a numerical standpoint, domestic customers represent approximately 92 per cent of the total served by the natural-gas industry. In contrast, domestic consumption accounts for only 29 per cent of the total. The importance of industrial consumption to the volume of natural-gas sales is disclosed by the accompanying table, summarizing customers, sales and revenue. The 45,800 industrial accounts represent only 0.6 per cent of the total but they consume almost 50 per cent of the industry's aggregate sales. The 92 per cent of domestic customers pay 57 per cent of the industry's total revenue for 30 per cent of the total consumption.

Continued to Lower Rates

Gas companies continued to lower rates for house heating through central-plant burners and equipment. The total number of gas central-house-heating installations connected to the lines of all United States gas companies in 1940 is estimated at 800,000. In addition there were approximately 1,800,000 dwellings heated by unit heaters, space heaters, floor furnaces and other similar installations, giving a total of more than 2,600,000 homes in the United States that are heated by gas.

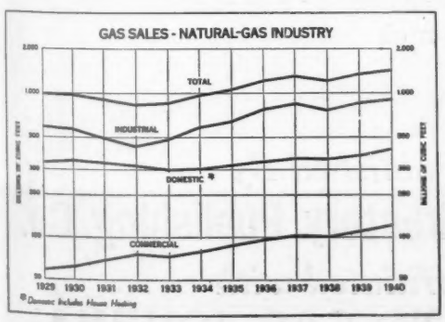
The gas industry is taking a leading part in supplying the industrial heating needs of factories and mills that are producing equipment and machines necessary in the national-defense program. For hardening the small and intricate parts of machine guns to the final heat treatment of the largest guns, specially designed gas furnaces are speeding production at an ever-increasing pace. In the Navy yards, some of the largest industrial furnaces ever built are annealing fully assembled gun turrets with gas.

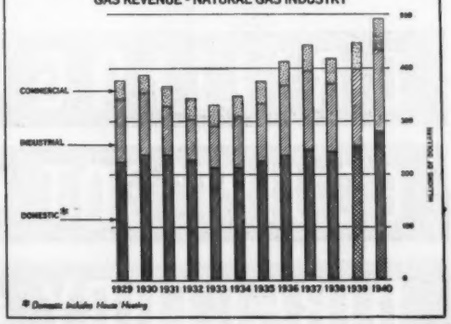
Industry and business used about 55 per cent more gas during 1940 than during the business-boom period of 1929. It is estimated that the normal use of industrial and commercial gas during 1941 will be at least 10 per cent greater than 1940 and supplementing this will be the quantities used for purely defense production in the United States and Canada.

Increased natural-gas production and expansion of service necessitated the construction of approximately 1,300 miles of lines in 1940, including new transportation systems and looping of arteries whose capacities became inadequate to meet load requirements. Consumption in the Middle West grew at a proportionately faster rate than in other parts of the country, partly because service for that large potential market is comparatively new.

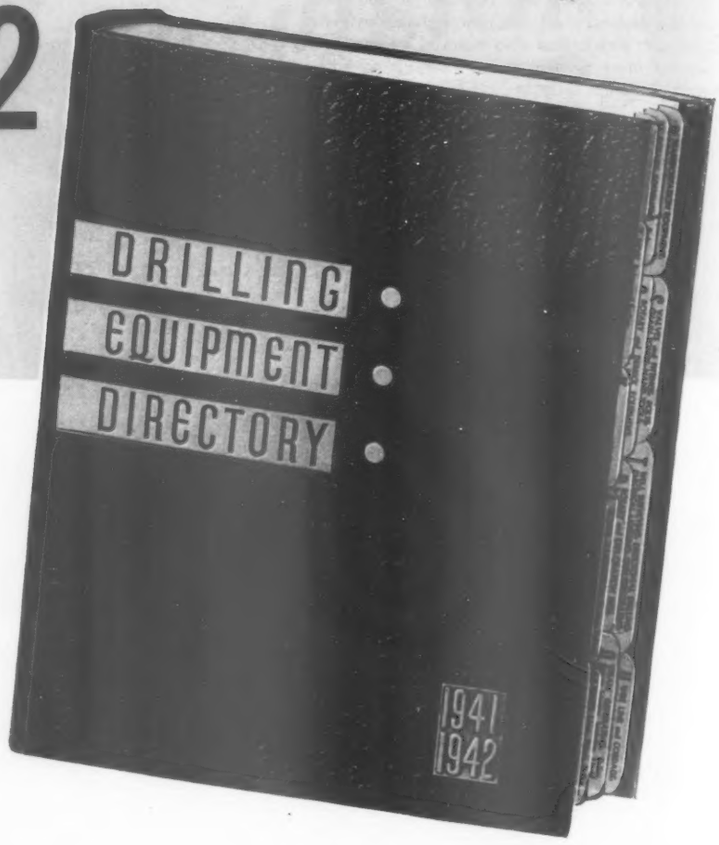
PRELIMINARY ESTIMATES ON THE NATURAL-GAS INDUSTRY FOR 1940

	1940	1939	Per cent change
Customers—			
Domestic (inc. house heating)	7,140,500	6,870,000	+3.9
Commercial	562,100	541,000	+3.9
Industrial	44,800	43,000	+4.2
Total	7,747,400	7,454,000	+3.9
Gas sales (M.c.f.)—			
Domestic (inc. house heating)	419,354,000	372,971,000	+12.4
Commercial	122,987,000	109,314,000	+12.5
Industrial	719,776,000	654,662,000	+9.9
Electric generation	182,546,000	191,296,000	—4.6
Total industrial and electric generation	902,322,000	845,958,000	+6.7
Total	1,444,663,000	1,328,243,000	+8.8
Revenue—			
Domestic (inc. house heating)	$281,467,000	$255,805,000	+10.0
Commercial	55,942,000	50,362,000	+11.1
Industrial and electric generation	153,867,000	142,692,000	+7.8
Total	$491,276,000	$448,859,000	+9.4




GAS REVENUE - NATURAL-GAS INDUSTRY
COMMERCIAL
INDUSTRIAL
DOMESTIC *
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940
* Domestic includes House Heating

HOW TO SELL MORE DRILLING EQUIPMENT IN 1941-42



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COASTAL LOUISIANA HAS ONE OF MOST SUCCESSFUL YEARS IN 1940

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THE Louisiana Gulf Coast district witnessed one of its busiest and most successful years of development during 1940, and all indications point to an increase in operations during 1941. There were 989 wells drilled of which 236 were dry and 12 gas wells. The total completed wells is an increase of 154 over the preceding year.

There were 17 new fields opened and with few exceptions all are generally recognized as important reserves. In addition, several million barrels in new reserves were added by new-sand discoveries around the flank of several known salt-dome structures, and this phase of operation can probably be classified as the most outstanding development during the year. The success of this development has resulted in a consistent uncovering of new reserves during the past 2 years, and this type of exploration is being extended to practically every salt-dome structure in the district. Salt structures receiving their first production or new-sand discoveries included Bayou de Glaise, Iberville Parish; Anse La Butte, St. Martin Parish; Bayou Blue, Iberville Parish; Jennings, Acadia Parish; Sulphur, Calcasieu Parish; Valentine, Plaquemines Parish; Hackberry, Cameron Parish; and Venice, Plaquemines Parish.

Anse La Butte

The discovery of a new sand on the west flank of the Anse La Butte field, St. Martin Parish, by Glassell & Glassell early in the year resulted in a revival of drilling activity, and production from approximately five additional sands has been uncovered. At a recent date some 10 operations were reported for the dome, and preparations were being made to drill an exceptionally deep test on the extreme southeast flank.

Wilcox Trend

While one new Wilcox sand pool was found, wildcatting along this particular sector of the trend was disappointing and interest at the present time is at a low ebb. The discovery was made by Atlantic Refining Co., which opened the Neale field, 6 miles northeast of Merryville in Beauregard Parish. The company has carried on an orderly development program, and has extended production over approximately 800 acres. The structure is partly defined to the north, east and west, and slightly to the southwest. While the discovery represents several million barrels in new reserves, the structure is not as prolific as the Eola field in Avoyelles

LOUISIANA GULF COAST DISCOVERIES IN 1940

Pool, parish, company, and farm name—	Survey	Date of Comp.	Producing formation	Producing depth	Initial production	No. prod. wells Jan. 1, '41
Bayou de Glaise, Iberville, Humble O. & R. Co., 2-B Wilberts	78-8s-8e	4-28	Miocene	8,648-57	345 bbl., ⅜-in. ck. (well later abd. due to S.W.)	0
Bayou Pigeon, Iberia, Plymouth, 1 McHugh	13-12s-10e	3-25	Miocene	8,052-72	408 bbl., ⅞-in. ck.	2
Chenier Ridge, Cameron, Phillips Pet. Co., 1 Miami Corp.	11-14s-6w	10-3	Miocene	10,194-10,200	129 bbl., ¼-in. ck.	1
Delta Farms, La Fourche, Tide Water Associated, 1 Delta Farms	6-17s-23e	3-25	Miocene	11,290-11,305	242 bbl. 12 hr., ¼-in. ck.	1
Erath, Vermilion, Texas Co., 1 Vermilion Parish School Board	16-13s-4e	4-24	Miocene	11,378-89	70 bbl., 9/64-in. ck.	2
Lake Salvador, St. Charles, Texas Co., 1 State	26-16s-22e	9-25	Miocene	9,775-9,800	840 bbl., ¼-in. ck.	2
Nibletts Farm, Jeff. Davis, Continental Oil Co., 1 Nibletts farm	1-11s-5w	4-8	Oligocene	11,604-24	100 bbl., various ck. (temp. abd.)	0
Ritchie, Acadia, Vincent-Welch et al, 1 McManus	21-7s-1w	6-19	Miocene	3,525-35	18 bbl., ⅞-in. ck. (well later W.O. and recomp. as gas well)	2
Schooner Bayou, Vermilion, Union Oil Co. of Calif., 1 Webster	17-15s-1e	7-15	Miocene	10,536-42	226 bbl., ¼-in. ck.	1
South China, Jeff. Davis, Union Sulphur Co., 1-A Calcasieu Natl. Bank	2-8s-4w	9-5	Oligocene	9,300-4	40 bbl. dist., 14/64-in. ck.	1
South Crowley, Acadia, Humble O. & R. Co., 1 Leger	22-10s-1e	9-5	Oligocene	7,598-7,612	779 bbl., ¼-in. ck.	2
Stella, Plaquemines, California Co. of Texas, 1 Delta Minerals	2-15s-24e	8-14	Miocene	7,485-90	486 bbl., ⅞-in. ck.	2
West Cote Blanche, St. Mary, Texas Co., 1 State	20-15s-6e	3-31	Miocene	3,109-36	24 bbl., 11/64-in. ck.	4
West Mermentau, Jeff. Davis, H. M. Naylor, 1 Acadia Dev. Co.	12-10s-2w	7-20	Oligocene	9,700-11	5 bbl. dist., ¼-in. ck.	1
Neale, Beauregard, Atlantic Ref. Co., 1 Whitmer	26-3s-11w	3-31	Wilcox	8,356-70	177 bbl. 12 hr., ⅞-in. ck.	10
West Bay, Plaquemines, Gulf Ref. Co., 1-B J. G. Timolat	36-22s-30e	12-14	Miocene	7,270-86	732 bbl., ¼-in. ck.	1
Sec. 28 Dome, St. Martin, Superior Oil Co., 1 E. C. Steuart	29-9s-7e	12-15	Miocene	9,300-30	Gas and dist.	1

LOUISIANA GULF COAST CRUDE-OIL PRODUCTION — JANUARY-DECEMBER 1940, INCLUSIVE

	Total	Dly. av	January	February	March	April	May	June	July	August	September	October	November	December
ACADIA COUNTY—														
Bayou Mallet	81,120	222	7,192	6,956	6,976	6,815	6,479	5,970	6,717	6,592	6,824	6,845	6,810	6,944
Bosco	1,737,007	4,746	134,819	131,650	146,118	147,413	152,861	153,390	148,881	149,251	141,746	144,731	142,710	143,437
Jennings	5,493,439	15,009	496,527	463,021	499,071	483,540	498,697	439,710	430,595	422,852	442,876	441,650	430,980	443,920
North Crowley	1,594,354	4,356	103,106	104,425	118,974	117,895	123,721	121,680	133,867	134,369	141,363	154,070	159,689	181,195
Tepetate	1,612,514	4,406	148,025	136,320	147,898	144,084	180,327	146,880	119,464	116,719	115,068	118,613	116,852	122,264
Miscellaneous	52,984	.....	3,410	3,700	5,926	4,001	3,999	4,590	2,722	2,288	6,033	7,065	6,299	2,945
Total	10,571,418	28,883	893,079	846,072	924,963	903,748	966,084	872,220	842,252	832,071	853,910	872,974	863,340	900,705
ALLEN PARISH—														
North Elton	8,607	24	.....	.....	483	418	868	810	973	1,250	890	904	1,050	961
ASCENSION PARISH—														
Darrow	752,961	2,052	71,362	64,052	69,645	68,778	69,006	63,000	60,593	54,934	54,940	58,297	57,718	60,636
Sorrento	70,801	193	6,789	6,443	6,596	6,086	7,316	5,910	5,834	5,458	5,324	5,134	4,920	4,991
Total	823,762	2,250	78,151	70,495	76,241	74,864	76,322	68,910	66,427	60,392	60,264	63,431	62,638	65,627
AVOYELLES PARISH—														
Eola	3,878,632	10,597	272,880	279,349	341,406	394,508	400,117	306,810	330,192	316,669	295,219	319,626	303,300	318,556
BEAUREGARD PARISH—														
Bancroft	1,083,505	2,960	97,340	82,102	92,978	83,971	99,479	124,770	87,070	84,489	78,026	83,069	86,790	83,421
Neale	317,392	867	.....	.....	990	3,360	7,719	7,440	24,332	31,768	48,625	59,571	64,798	68,789
Total	1,400,897	3,827	97,340	82,102	93,968	87,331	107,198	132,210	111,402	116,257	126,651	142,640	151,588	152,210
CALCASIEU PARISH—														
Edgerly	98,526	269	7,936	6,688	7,123	6,792	7,192	8,880	6,840	7,053	10,671	10,344	11,040	7,967
Gillis	1,591,077	4,347	146,723	137,755	149,583	138,854	142,972	150,300	118,597	125,754	127,999	128,195	123,750	100,595
Lockport	305,091	834	22,754	22,804	23,409	21,735	21,979	27,360	32,789	30,173	25,133	26,816	27,540	22,599
Starks	161,710	442	13,640	12,130	11,909	13,122	13,082	14,100	12,031	15,395	14,300	14,271	13,470	14,260
Sulphur	986,372	2,695	81,561	74,009	83,603	73,385	74,710	82,500	88,078	84,372	83,286	91,870	88,139	80,259
Vinton	321,124	877	28,830	27,484	27,418	26,471	27,559	34,200	26,193	25,255	24,573	24,458	24,120	24,563
Total	3,463,900	9,390	301,444	281,470	303,045	280,359	287,494	317,340	284,528	288,002	285,962	295,954	288,059	250,243
CAMERON PARISH—														
Black Bayou	1,009,478	2,758	87,203	87,146	87,069	82,501	84,506	82,410	87,500	84,013	80,491	81,037	79,050	86,552
Cameron Meadows	710,912	1,942	55,025	53,877	53,744	62,178	65,038	66,750	61,422	52,294	60,153	57,773	62,879	59,779
Chalkley	949,043	2,593	60,047	51,363	64,129	75,590	81,127	81,870	84,871	76,000	84,969	92,853	96,838	99,386
Creole	581,033	1,588	57,474	53,961	63,449	60,831	63,116	47,940	43,538	43,393	38,983	35,726	34,647	37,975
East Hackberry	1,649,644	4,507	147,994	132,351	144,613	136,511	149,792	149,700	136,239	116,355	125,526	130,204	133,140	147,219
Grand Lake	1,391,105	3,800	39,091	44,668	66,768	92,717	108,438	104,010	148,606	164,139	158,650	148,374	146,880	168,764
Sweet Lake	527,813	1,442	26,831	26,085	31,076	35,815	40,765	43,350	52,561	55,492	52,113	54,654	53,547	55,524
West Hackberry	1,671,942	4,568	116,033	115,812	129,792	138,547	132,122	137,010	140,728	143,518	148,575	154,406	154,230	161,169
Little Chenier	3,319	9	.....	.....	.....	.....	.....	.....	959	105	200	.....	660	1,395
Total	8,494,289	23,181	589,698	565,263	640,640	684,690	724,904	713,040	756,424	735,309	749,660	755,027	761,871	817,763
EAST BATON ROUGE PARISH—														
University	3,472,713	9,488	284,735	280,424	302,327	308,131	338,799	277,200	273,772	281,597	275,867	281,984	279,298	288,579
EVANGELINE PARISH—														
Ville Platte	4,453,876	12,169	390,011	370,085	405,818	389,630	457,374	463,800	337,768	350,253	341,493	313,431	312,960	321,253
IBERIA PARISH—														
Bayou Pigeon	94,108	257	.....	.....	796	7,470	8,029	7,440	7,129	7,471	13,780	13,954	14,430	13,609
Fausse Point	24,824	68	1,519	683	2,572	2,322	2,489	5,220	1,473	1,823	1,916	1,408	1,920	1,488
Jefferson Island	350,030	956	24,025	22,475	26,334	27,226	29,574	28,740	32,488	29,589	28,923	30,744	32,340	37,572
New Iberia	3,089,091	8,440	301,506	311,318	318,858	312,152	280,860	229,500	250,592	230,763	227,772	212,770	197,581	215,419
Vermilion Bay	79,597	218	8,075	9,424	10,075	6,017	4,867	6,600	2,912	2,463	2,199	4,680	10,350	11,935
Total	3,637,650	9,939	335,125	343,900	358,635	355,187	325,810	277,500	294,594	272,109	274,590	263,556	256,621	280,023

LOUISIANA GULF COAST CRUDE-OIL PRODUCTION (Continued)

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
IBERVILLE PARISH—														
Bayou Blue	137,421	375	3,038	2,951	3,501	4,312	4,185	5,280	7,130	7,662	10,450	23,257	27,990	37,665
Bayou Bouillon	30,980	85	1,178	1,030	799	746	775	2,040	2,578	5,206	4,063	1,945	4,110	6,510
Bayou de Glaise	8,890	24	.....	.....	.....	1,388	3,782	3,720	.....	.....	.....	.....	.....	.....
Choctaw	440,169	1,202	26,226	30,066	24,742	30,403	36,425	41,910	45,734	39,419	39,026	42,168	45,269	38,781
White Castle	805,993	2,202	56,978	54,294	61,299	64,600	66,960	59,610	70,243	69,342	72,349	71,554	73,198	85,560
Total	1,423,453	3,889	87,420	88,341	90,341	101,449	112,127	112,560	125,685	121,629	125,888	138,924	150,567	168,522
JEFFERSON PARISH—														
Barataria	423,260	1,156	8,525	14,514	15,141	23,402	31,775	27,350	30,139	46,382	56,707	57,604	54,720	57,001
Lafitte	4,535,813	12,393	347,820	334,602	373,822	379,501	413,509	382,440	406,153	407,016	391,355	374,320	371,379	353,896
Total	4,959,073	13,549	356,345	349,116	388,963	402,903	445,284	409,790	436,292	453,398	448,062	431,924	426,099	410,897
JEFFERSON DAVIS PARISH—														
Iowa	3,448,271	9,422	318,556	299,255	324,999	309,572	337,745	272,940	271,122	280,635	268,979	234,157	256,798	273,513
Roanoke	611,786	1,671	50,127	53,643	51,367	49,356	54,126	53,280	41,819	54,662	52,577	49,049	48,782	52,948
South Roanoke	372,551	1,018	34,565	33,789	36,631	33,900	33,170	30,300	25,982	26,907	30,105	30,094	28,712	28,396
Woodlawn	870,862	2,379	60,977	46,770	63,136	59,805	71,424	66,300	78,616	81,941	93,630	80,785	75,780	91,698
Miscellaneous	107,124	.....	8,618	7,897	9,531	10,003	12,121	10,740	7,796	6,518	8,681	8,063	8,431	7,905
Total	5,410,594	14,783	472,843	441,354	485,664	462,636	508,636	433,560	425,385	450,663	454,742	402,148	418,503	454,460
LA FOURCHE PARISH—														
Chacahoula	466,890	1,276	29,853	33,336	36,165	41,999	42,749	37,410	41,162	44,909	42,545	39,570	39,000	38,192
Delta Farms	21,478	59	.....	.....	.....	.....	.....	.....	.....	.....	720	6,974	6,840	6,944
Golden Meadow	4,009,487	10,955	239,134	282,995	332,789	370,708	385,020	325,500	341,516	377,620	374,405	329,320	316,920	333,560
La Fourche Crossing	194,394	531	9,672	9,303	10,183	15,972	17,856	17,580	15,728	14,529	15,988	23,187	22,140	22,256
Lake Long	471,966	1,290	35,123	41,392	49,849	41,657	41,013	41,220	40,132	34,755	38,379	36,019	34,979	37,448
Leeville	1,167,676	3,190	84,940	83,623	97,203	89,471	96,038	91,350	96,847	99,719	101,274	104,854	99,659	122,698
Raceland	452,063	1,235	31,279	28,693	30,698	31,871	40,517	35,910	37,887	44,239	44,957	45,839	39,780	40,393
Timbalier Bay	65,603	179	3,565	6,202	6,417	5,652	6,169	6,000	5,655	4,556	5,260	5,807	4,740	5,580
Valentine	876,725	2,394	73,315	64,996	75,758	75,710	81,034	74,340	72,893	79,536	70,495	73,660	73,980	61,008
Total	7,726,282	21,110	506,881	550,540	639,062	673,060	710,396	629,310	651,820	699,863	694,023	665,230	638,038	668,079
PLAQUEMINES PARISH—														
Garden Island Bay	1,097,182	2,998	77,500	74,626	88,125	83,300	92,969	92,940	100,096	101,214	96,708	96,874	95,490	97,340
Grand Bay	1,163,408	3,179	55,955	54,674	65,233	83,139	96,596	87,900	115,425	121,199	120,235	119,429	115,500	128,123
Lake Hermitage	10,109	27	1,302	624	804	906	1,302	1,440	758	810	636	710	662	155
Stella	36,282	99	.....	.....	3,569	3,736	.....	4,440	.....	.....	4,241	250	10,260	9,786
Lake Washington	205,369	561	16,089	17,400	18,600	18,000	19,003	15,900	15,072	18,681	28,198	13,020	12,510	12,896
Potash	272,102	743	10,912	14,034	15,054	22,098	28,723	27,600	20,010	19,130	25,824	27,896	27,000	33,821
Quarantine Bay	1,548,891	4,232	111,073	107,902	123,827	129,657	137,640	124,440	145,787	145,563	136,546	134,654	121,230	130,572
Venice	828,261	2,263	56,668	60,566	64,244	64,636	75,795	62,280	74,448	79,976	76,065	74,084	67,920	71,579
Total	5,161,604	14,103	329,499	329,826	379,456	405,472	452,028	416,940	471,596	486,573	488,453	466,917	450,572	484,272
RAPIDES PARISH—														
Cheneyville	969,614	2,649	82,553	77,596	77,066	84,223	95,542	87,180	77,235	78,079	68,971	78,836	76,680	85,653
ST. BERNARD PARISH—														
Kenilworth	76,106	208	5,952	5,596	5,953	6,370	5,952	6,690	6,897	7,055	6,693	6,471	6,246	6,231
ST. CHARLES PARISH—														
Bayou des Allemands	91,535	250	11,811	9,599	10,106	9,940	7,905	7,500	7,635	6,141	5,372	4,655	4,950	5,921
Paradis	331,181	905	11,408	10,716	14,358	21,517	23,405	17,910	29,992	34,396	35,475	41,291	39,842	50,871
Total	422,716	1,155	23,219	20,315	24,464	31,457	31,310	25,410	37,627	40,537	40,847	45,946	44,792	56,792
ST. JAMES PARISH—														
Miscellaneous	55,261	151	4,526	4,874	4,044	4,053	4,495	4,380	3,374	3,878	3,084	3,979	5,305	9,269
ST. JOHN THE BAPTIST PARISH—														
La Place	28,685	78	899	695	1,311	2,185	3,937	3,720	2,942	2,910	3,294	2,646	2,069	2,077
ST. LANDRY PARISH—														
Port Barre	883,928	2,415	63,426	60,030	69,175	62,631	67,270	91,440	83,910	83,898	74,293	76,641	76,318	74,896
ST. MARTIN PARISH—														
Anse La Butte	409,221	1,118	527	4,846	4,577	7,505	11,408	10,410	35,211	51,828	60,798	68,612	73,650	79,849
Happytown	109,123	298	10,075	9,425	10,075	9,751	9,889	8,250	8,525	8,525	7,956	7,750	7,531	11,371
Lake Mongoulois	4,429	12	.....	.....	.....	779	713	660	472	.....	159	773	780	93
Plumb Bob	107,775	294	7,936	7,973	8,524	8,249	10,230	7,440	10,962	10,723	9,528	9,786	8,760	7,664
St. Martinsville	124,215	339	14,725	13,773	14,723	14,249	14,167	10,440	9,864	3,084	1,971	9,301	9,300	8,618
West Lake Verret	177,051	484	10,137	9,211	9,517	8,918	14,105	16,410	10,512	11,923	18,181	20,837	23,430	23,870
Total	931,814	2,546	43,400	45,228	47,416	49,451	60,512	53,610	75,546	86,083	98,593	117,059	123,451	131,465
ST. MARY PARISH—														
Bateman Lake	316,709	865	31,713	28,042	26,277	24,246	26,040	36,180	26,870	26,239	24,804	23,342	21,690	21,266
Charenton	2,846,772	7,778	312,945	293,740	262,937	254,601	276,179	246,360	215,055	244,937	212,936	191,460	171,327	184,295
Horseshoe Bayou	423,192	1,156	20,460	31,843	33,538	33,150	36,952	35,940	36,392	36,242	41,417	41,211	38,010	38,037
Jeanerette	1,217,656	3,327	116,839	107,331	118,330	108,856	111,073	93,750	100,448	96,028	91,332	87,882	93,779	92,008
West Cote Blanche	102,389	280	.....	.....	24	219	2,077	4,500	8,506	13,355	13,799	14,829	22,140	22,940
Total	4,906,718	13,406	481,957	460,956	441,106	421,072	452,321	416,730	387,271	396,801	384,288	358,724	346,946	358,546
TERREBONNE PARISH—														
Bay St. Elaine	141,092	385	10,292	9,672	9,092	9,528	8,804	7,440	13,357	12,206	12,920	13,678	16,650	17,453
Caillou Island	2,472,973	6,757	208,010	203,003	237,401	246,739	252,526	239,610	204,280	187,723	182,250	172,572	165,538	173,321
De Large	59,363	162	6,169	5,790	6,205	6,047	6,200	5,220	4,050	1,477	4,627	4,640	4,350	4,588
Dog Lake	298,518	816	25,203	26,099	27,900	22,824	21,390	21,390	18,614	16,139	26,512	27,322	29,940	35,185
Gibson	1,316,432	3,597	113,801	106,459	108,584	102,152	110,701	97,380	113,650	116,397	113,058	109,137	110,010	115,103
Lake Barre	316,802	866	24,676	24,895	29,302	30,426	29,326	30,300	26,524	27,103	28,010	23,591	21,600	21,049
Lake Pelto	509,071	1,391	50,530	42,855	44,155	42,812	47,151	43,440	45,458	42,660	42,654	36,268	35,159	35,929
Lirette	26,497	72	.....	.....	.....	.....	.....	.....	3,264	3,525	3,148	4,043	4,860	7,657
South Houma	165,892	453	16,647	15,831	16,886	15,488	16,213	14,910	12,401	12,457	11,715	11,261	10,830	11,253
Total	5,306,640	14,499	455,328	434,604	479,525	476,016	492,321	459,690	441,598	419,687	424,894	402,512	398,937	421,538
VERMILION PARISH—														
Abbeville	170,743	467	11,005	14,285	14,127	14,158	16,182	24,750	11,088	9,536	11,318	12,197	13,830	18,267
Erath	7,183	20	.....	.....	.....	315	465	.....	1,392	1,248	946	368	.....	2,449
Gueydan	134,168	367	12,958	12,251	13,079	12,586	12,958	12,600	2,800	2,850	15,011	11,941	10,378	14,756
West Gueydan	226,939	620	17,515	19,134	21,351	20,578	21,824	22,650	12,458	12,623	15,030	21,221	20,669	21,886
Schooner Bayou	12,666	35	.....	.....	.....	.....	.....	.....	769	.....	2,575	3,518	3,240	2,573
Total	551,699	1,507	41,478	45,670	48,557	47,637	51,429	60,000	28,498	26,257	44,880	49,245	48,117	59,931
Total	79,019,931	.....	6,198,189	6,033,901	6,629,629	6,709,461	7,178,520	6,640,850	6,554,008	6,611,220	6,625,511	6,356,729	6,493,365	6,788,498
Daily average	215,901	.....	199,942	208,066	213,859	223,649	231,565	221,362	211,420	213,265	220,850	211,507	216,446	218,984

Parish, a 1939 discovery which led to an extensive wildcatting play through the northern tier of parishes. Although numerous prospects have been marked up as dry, many of these are being rechecked by geophysical instruments and additional development is expected to be started in the future.

Bayou Blue and Bayou de Glaise

The Bayou Blue dome, Iberville Parish, which has been inactive for a number of years, is again in the limelight as the result of new-sand discoveries on the west flank by Superior Oil Co., while several companies revived production from new shallow sands on top of the structure.

Humble Oil & Refining Co. added the Bayou de Glaise dome, Iberville Parish, to the list of producing fields with the completion of 2-B Wilberts, completed in sand at 8,648-57 ft., for an initial production of 345 bbl. per day through a $\frac{1}{4}$-in. choke. However, the well was later abandoned due to salt water and mechanical trouble, and at the close of the year the company was attempting to reopen production with the completion of 3-B Wilberts located just north of the discovery well.

While the potentialities of these old salt structures have been recognized for a number of years, it was not until the past 2 years that any real attempt was made to explore the flanks. At one time all such structures had been under lease to one or more companies, but leases were soon dropped due to declining production from the shallow sands on top of the structures. This type of development first received wide attention with the discovery of flank production at the old Jennings field. Within the past 2 years major companies and independents have reacquired formerly released acreage on every salt structure in the district, and after extensive geophysical work preparations are being made to carry on a prolonged drilling campaign.

Deep Exploration

Deeper exploration continues to be responsible for the high rate of new discoveries in the district. Of the total number of fields opened, five are producing from sands below 10,000 ft., and two from sands below 9,700 ft. Practically all of these fields are controlled by one or two companies, and as a result development is limited and their potentiality cannot be accurately measured. However, several of these deep discovery wells are known to have cored several sands capable of producing and thus opened up important reserves. The 10,000-ft. discoveries include Schooner Bayou, Vermilion Parish, opened by Union Oil Co. of California at a depth of 10,536-42 ft.; Niblett Farms, Jefferson Davis Parish, producing from sand at 11,604-24 ft.; Erath,

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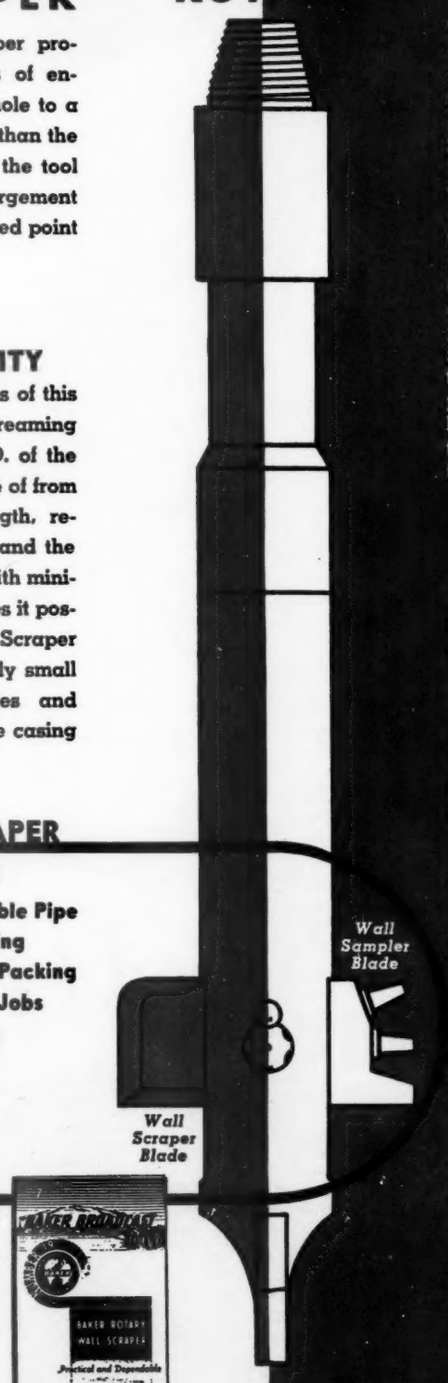
Setting Cement Plugs
Directional Drilling
Water Shut-Off Tests
Setting Liners

Send for Baker Broadcast No. 19 which describes and illustrates the many important applications for the Baker Wall Scraper and Wall Sampler.



WALL SAMPLER

The Baker Rotary Wall Scraper is really "Two Tools in One," since by merely substituting Sampler Blades for the regular Scraper Blades the tool is converted into a Baker Rotary Wall Sampler . . . an exclusive Baker feature. With this device it is possible to take actual cores from the side-walls of any uncased hole at any depth, and thus opens up new opportunities for restoring lost core records, or for checking formations which were not cored when drilled through. It also provides a positive means of checking interesting zones brought out by electrical coring methods. The Wall Sampler cores range from 1½" to 2½" in length; from 7/16" to 11/16" in diameter, thus providing adequate samples for physical and laboratory tests.

DOUBLE VALUE FOR YOUR MONEY

As illustrated, the Baker Wall Sampler consists essentially of a Baker Wall Scraper Assembly, except that a special set of Wall Sampler Blades are used in place of the normal cutting blades of the Wall Scraper. This conversion feature of the Wall Scraper is a combination that means double value for your money.

Each Sampler Blade has two core taking tubes screwed into the upper section of the flat outer edge. These Blades do not have a cutting edge, but serve only to get the core taking tubes into the formation and take any strain off the tubes as the Blades are forced into the walls of the hole.

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The safety of the Baker Wall Scraper and Wall Sampler has been demonstrated in thousands of successful runs made in oil fields throughout the world, under the most difficult operating conditions. To our knowledge no Baker Wall Scraper or Wall Sampler has ever failed to come safely out of the hole with the hole ready for further operations.

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a Texas Co. discovery, producing from 11,378-89 ft.; Delta Farms, La Fourche Parish, opened by Tide Water at a depth of 11,290-11,305 ft.; and the Chenier Ridge field, Cameron Parish, opened by Phillips Petroleum Co. at a depth of 10,194-10,200 ft.

Frio Production

Of the new sands opened in proven fields, probably the most important was the discovery of Frio production in the Iowa field, Calcasieu and Jefferson Davis parishes, by Magnolia Petroleum Co. The discovery well, 9 Wait, was deepened from one of the field's shallower sands to a depth of 8,237 ft., and was completed in the Frio sand at 8,230-36 ft. for an initial production of 653 bbl. per day through a ¼-in. choke. The well is located a short distance to the northwest of the center of the field, and its completion resulted in a revival of drilling in the field, which has been inactive for a number of years. Since its completion, Shell Oil Co., Inc., Barnsdall Oil Co., Stanolind Oil & Gas Co., Glassell & Glassell, and S. W. Richardson have entered the area, with the result that a portion of the deep sand has been defined to the south and west, while production from another sand at 7,570-73 ft. was opened by Shell Oil Co., Inc.

La Pice

Another important sand discovery was recorded for the La Pice field, St. James Parish, which converted this gas-distillate structure into an oil field. The field which is controlled by Shell Oil Co., Inc., was opened in 1939, and two gas-distillate wells had been drilled prior to the completion of 1 Federal Land Bank, located ½ mile northwest of the discovery well. The completion was made in the Miocene sand at 7,646-52 ft., some 3,000 ft. shallower than the two distillate wells.

Wildcatting in Delta

One of the most important phases of development at the close of the year was the increasing amount of wildcatting activity getting under way along the Delta district bordering the Mississippi River in the extreme southeastern part of the district. Most of the territory here is submerged land and practically all work is done by marine operations. This condition increases the cost of development, and for this reason only a few wells have been drilled. However, such discoveries as Lake Salvador in St. Charles Parish and West Bay in Plaquemines Parish have placed the area in a favorable light and several wildcats are being started. The area has been worked extensively by geophysical instruments and several interesting structures are said to have been found.

Another important discovery for this area was the Delta Farms field in La Fourche Parish, which was opened by the Tide Water Associated Oil Co. at 11,290-11,305 ft. The company later defined the structure to the southeast, but recent development by the Texas Co. 1 mile southeast opened production from a new sand

(Continued on Page 94)

Field Developments in 1940

Parish and field—	No. wells Jan. 1	No. wells Dec. 31
Acadia:		
Bayou Mallet	5	5
Bosco	56	56
Jennings	158	137
N. Crowley	17	36
Tepetate	5	50
Allen:		
N. Elton	2	2
Ascension:		
Darrow	14	17
Sorrento	8	4
Avoyelles:		
Eola	47	92
Beauregard:		
Bancroft	32	41
Neale	0	10
Calcasieu:		
Edgerly	15	15
Gillis	42	39
Lockport	23	17
Starks	23	22
Sulphur	60	52
Vinton	74	133
Cameron:		
Black Bayou	19	20
Cameron Meadows	32	30
Chalkley	8	17
Creole	9	8
E. Hackberry	62	64
Grand Lake	5	22
Sweet Lake	7	12
W. Hackberry	106	61
Little Chenier	0	1
E. Baton Rge:		
University	59	89
Evangeline:		
Ville Platte	82	133
Iberia:		
Bayou Pigeon	0	2
Fausse Pt.	2	4
Jeff. Island	4	6
New Iberia	65	75
Vermilion Bay	11	2
Iberville:		
Bayou Blue	2	11
Bayou Bouillon	1	2
Bayou de Glaise	0	0
Choctaw	12	14
White Castle	8	14
Jefferson:		
Barataria	1	10
Lafitte	36	50
Jeff. Davis:		
Iowa	48	52
Roanoke	22	17
S. Roanoke	7	7
La Fourche:		
Chacahoula	4	7
Delta Farms	0	1
Golden Meadows	52	143
La Fourche Crossing	1	4
Lake Long	8	12
Leeville	87	82
Raceland	3	7
Timbalier Bay	2	2
Valentine	24	25
Plaquemines:		
Garden Island Bay	15	24
Grand Bay	8	21
Lake Hermitage	2	2
Stella	0	2
Lake Washington	7	7
Potash	3	8
Quarantine Bay	16	23
Venice	11	15
Rapides:		
Cheneyville	19	31
St. Bernard:		
Kenilworth	1	1
St. Charles:		
Bayou des Allemands	2	5
Paradis	2	8
St. John the Baptist:		
La Place	1	3
St. Landry:		
Port Barre	30	29
St. Martin:		
Anse La Butte	9	28
Happytown	1	2
Lake Mongoulois	2	3
Plumb Bob	1	2
St. Martinsville	2	2
W. Lake Verret	2	5
St. Mary:		
Bateman Lake	4	5
Charenton	139	179
Horseshoe Bayou	4	5
Jeanerette	23	21
W. Cote Blanche	0	4
Terrebonne:		
Bay Ste. Elaine	4	7
Caillou Isl.	41	48
De Large	1	1
Dog Lake	8	10
Gibson	13	17
Lake Barre	22	22
Lake Pelto	11	11
Lirette	3	7
S. Houma	2	2
Vermilion:		
Abbeville	8	7
Erath	0	1
Gueydan	5	5
W. Gueydan	4	6
Schooner Bayou	0	1
Total	1,823	2,292

Miscellaneous Fields

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Acadia Parish:				
Cankton	8,469	23	1	1
North Tepetate	30,490	83	0	1
Ritchie	92	3	0	1
South Crowley	13,933	38	0	2
Jeff. Davis Parish:				
Niblett's	1,410	30	0	0
South Elton	21,635	31	1	1
South Jennings	58,238	159	0	4
Welsh	8,935	24	13	13
China	3,571	30	0	1
West Mermentau	7,335	60	0	1
St. James Parish:				
Hester (Convent)	16,181	44	1	1
La Pice	39,080	107	1	3

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CUMBERLAND POOL IS OUTSTANDING DISCOVERY FOR OKLAHOMA

By ROBERT INGRAM

DISCOVERY of the Cumberland pool on the northern boundary of Marshall and Bryan counties in the spring of 1940 by the Pure Oil Co. gave Oklahoma its most important single new oil field in 2 years.

It accounted for nearly one-fourth of the total new reserves proven during the year, and pool limits had not yet been defined by the 15 wells drilled and put in production by year's end.

Twenty-nine smaller pools were opened in various other parts of the state, most of them on local highs or "pimples," and several productive areas, notably Dill and Hewitt, were extended. Development continued in the Cement, St. Louis, Greater Seminole and Creek County districts. Hunton lime production was also being developed late in the year by wells plugged back from the Wilcox sand in two 1938 discoveries, the Coyle and Ramsey pools of Payne County.

Okfuskee County

Of the lesser discoveries of the year, those in Okfuskee County, which has been a producing area since 1913, held the greatest interest. Drilling activity and exploration held strong through the last half of the year and into the new year and indications were that the area would show important developments during 1941.

At least one new Okfuskee County pool was assured for 1941 by a wildcat north of the town of Okemah which came in as a producer on New Year's day. It was Selden Henry, Arrow Drilling Co. et al 1 Dudgeon, NE SW SE 36-12-9, a Gilcrease sand well that flowed 383 bbl. of 35.5 gravity oil in 7 hours on an unofficial gage.

Among developments in Okfuskee County during the year:

1. The 6-year-old Dill pool was extended to the northwest several times by big producers and its limits are yet to be defined.

2. A townsite drilling program was started at Weleetka.

3. Two productive areas—North Cromwell and East Cromwell—were opened to the northeast of the old Cromwell field in Seminole County and may be joined by future development.

4. Several pools were opened in the Okemah district and townsite development at Okemah is a possibility of the near future.

5. At year's end, eight wildcats were reported drilling, and lease trading continued fairly active as major companies gradually increased their holdings.

The Dill pool, discovered in August, 1934, by Carter Oil Co. 1 Dill, C NW SE 2-11-8, has been productive from both the Cromwell and Hunton formations. It was developed on a slow and orderly plan of 10-acre spacing for Cromwell tests and 40-acre spacing for the Hunton, and was confined principally to 2 and 11-11n-8e because of a series of dry holes to the north.

In May of this year, however, John Droppleman and Wewoka Standard Oil Co. completed 1 Gahagan, NE NE NE 3-11n-8e, extending the pool about ½ mile northwestward and into the northeast corner of Seminole County. It was completed in Wapanucka-Cromwell zone for 800 bbl., and since then several big wells have been completed in the extension area which cut across Seminole County and back into Okfuskee.

Recent completions by Droppleman, C. M. Seran, Shell Oil Co., I. T. I. O., Wewoka Standard Oil Co., and others, include wells with initial daily yields of 1,000 to 3,000 bbl.

North and East Cromwell

The North and East Cromwell pools, both 1940 discoveries, south of Dill, are among the busier areas in the county and are being developed more rapidly than some of the other new Okfuskee pools. Linking of the pools was indicated in October when Foundation Oil Co. completed 1 Berryman, NE cor. 35-11n-8e, for 75 bbl.

Besides North and East Cromwell and extensions to the Dill pool, four new pools were opened in Okfuskee County. They were West Weleetka, Mason, Okemah North and East Okemah. Development work has already started in all of these areas, and at Weleetka a townsite drilling program got under way. Townsite drilling was also threatened at Okemah.

Hewitt and West Hewitt

Another lively campaign was started in September in Carter County where an extension to the Hewitt pool was opened at W. F. Turner 1 Ward, NW NW NW 28-4s-2w. The extension appeared to be cut off

(Continued on Page 93)

OKLAHOMA DISCOVERIES IN 1940

Field and county—	Location	Operator	Month	No. wells	Prod. formation	Top	Depth	Initial yield
Edna, Creek	24-14-10	Vierson, Martin et al	January	3	Wilcox	3,171	3,197	83
West Weleetka, Okfuskee	18-10-11	Summitt Drilling and Paul McIntyre	January	11	Booch	2,294	2,310	476
East Hallett, Pawnee	3-20-7	Portable Drilling Co.	February	abd.	Cleveland	2,141	2,167	45
East Broyles, Payne	24-18-4	T. N. Berry & Co.	March	4	Oswego	2,920	3,720	200
North Wewoka, Seminole	32- 9-8	Stanolind Oil & Gas Co.	March	2	Simpson-Wilcox	4,370	4,394	442
Kendrick, Lincoln	6-15-5	Summitt Drilling and Paul McIntyre	April	1	Prue	3,524	4,637	635
South Langston, Logan	31-17-1e	Helmerich & Payne et al	April	1	Simpson-Wilcox	5,258	5,435	61
Perkins, Lincoln	24-17-2	Portable Drilling Co.	April	2	Hunton	4,500	4,770	591
Cumberland, Marshall	28-5s-7	Pure Oil Co.	April	15	Tulip Creek	4,952	5,640	4,542
East Okemah, Okfuskee	11-11-10	C. A. Yoakum et al	April	4	Cromwell	3,140	3,176	75
South Clarita, Coal	35-1n-8	Barry et al	April	1	Wapanucka	1,821	1,954	15
West Arno, Creek	34-14-7	Bryan Petroleum Co.	April	1	Prue	2,556	2,652	140
Prague, Pottawatomie	4-11-6	H. L. Berkey	May	3	Skinner	3,262	4,688	182
North Cromwell, Okfuskee	26-11-8	C. W. Titus	February	7	Cromwell	3,478	3,501	105
East Cromwell, Okfuskee	36-11-8	Reese Drilling Co.	August	15	Cromwell	3,462	3,476	340
Mason, Okfuskee	9-12-9	Burke-Greis Oil Corp.	September	1	Hunton	3,890	3,936	85
North Okemah, Okfuskee	5-11-10	Texas Co.	August	1	Hunton	3,678	3,719	243
South Olive, Creek	29-18-8	O. E. Dempsey	July	1	Prue	2,445	2,455	48
West Stillwater, Payne	20-19-2	W. H. Elson	August	2	Hunton	4,552	4,576	700
Enid, Garfield	23-23-6w	Champlin Refining Co.	August	1	Mississippi	6,135	6,190	75
West Wildhorse, Osage	25-22-9	Norbla Oil Co.	August	1	Arbuckle	2,423	2,449	105
South Hominy, Osage	29-22-9	E. O. Platter	September	1	Oswego	1,772	1,784	50
Avery, Payne	17-17-6	R. L. Kemp et al	July	2	Prue	2,874	2,897	25
South Lovell, Logan	3-17-4w	Danciger Oil & Refineries, Inc.	October	3	Layton	3,860	3,890	200
North Tibbens, Creek	20-15-9	W. P. Springer	October	2	Wilcox	3,641	3,657	75
East Stroud, Creek	31-15-7	Shell Oil Co.	October	2	Wilcox	4,078	4,119	*143
West Davenport, Lincoln	5-14-5	Vierson et al	August	2	Prue	3,518	3,532	17
Payson, Lincoln	7-12-5	Mason-Stuart	November	1	Skinner	4,220	4,242	80
Romulus, Pottawatomie	6- 7-4	J. F. Smith	August	4	Hunton	3,954	3,993	265
West Hewitt, Carter	28-4s-2w	W. F. Turner	September	4	Sand	2,160	2,173	166
EXTENSIONS TO OLD AREAS								
Jackson, Seminole	22- 8-7	Devonian Oil Co.	February	1	Gilcrease		3,205	31
Okemah, Okfuskee	36-11-9	Paul McIntyre et al	February	1	Wilcox	3,765	3,821	154
Gray, Pottawatomie	26- 6-4	Vierson et al	March	1	Lime		3,670	40
Skellyville, Lincoln	32-16-6	Youngblood et al	March	3	Hunton	3,934	4,179	104
Fish, Seminole	18- 7-8	Winona Oil Co.	May	1	Wilcox	4,190	4,196	750
West Earlsboro, Pottawatomie	24- 9-4	Alma Oil Co.	May	2	Viola	4,354	4,510	75
West Earlsboro, Pottawatomie	26- 9-4	J. W. Meazel	June	2	Hunton	4,196	4,508	118
Wilzetta, Lincoln	2-12-5	Alma Oil Co.	April	11	Simpson	4,515	4,531	160
West Seminole, Seminole	30- 9-6	Amerada Petroleum Corp.	December	1	Wilcox	4,220	4,274	460
West Little River, Seminole	21- 7-6	Charles Newsome	October	1	Calvin	2,326	2,339	42
Calvin, Hughes	5- 5-10	Ramsey Petroleum Corp.	October	1	Cromwell	4,465	4,529	190
Dill, Okfuskee	3-11-8	John Droppleman and Wewoka Standard Oil Co.	May	1	Hunton and Cromwell	....	3,408	388
GAS DISCOVERIES								
								(Cu. ft.)
Altus area, Jackson	4-1n-20w	Gulf Oil Corp.	February	1	Sand	1,612	2,558	1,000,000
South Birch Creek, Osage	4-23-10	Norbla & Peters	March	1	Bartlesville		2,558	3,900,000
Alsuma area, Tulsa	26-19-13	Daisy Drilling Co.	April	1	Senora	2,251	2,294	3,000,000
Bethel area, Seminole	13- 9-7	W. O. Mason et al	April	1	Sand		1,351	1,000,000
Yeager area, Hughes	17- 8-10	Tomlinson et al	May	1	Cromwell	3,189	3,248	4,250,000
Okemah area, Okfuskee	34-12-9	C. A. Yoakum et al	June	1	Sand		3,826	7,000,000
Yingling, Pontotoc	31- 5-4	Yingling et al	June	1	Cleveland	2,010	2,267	11,000,000
Oktaha area, Muskogee	16-13-7	R. Garrett	June	1	Sand	1,630	1,660	2,500,000
North Agra, Lincoln	28-17-5	R. L. Kemp et al	October	1	Viola	3,882	3,925	3,985,000

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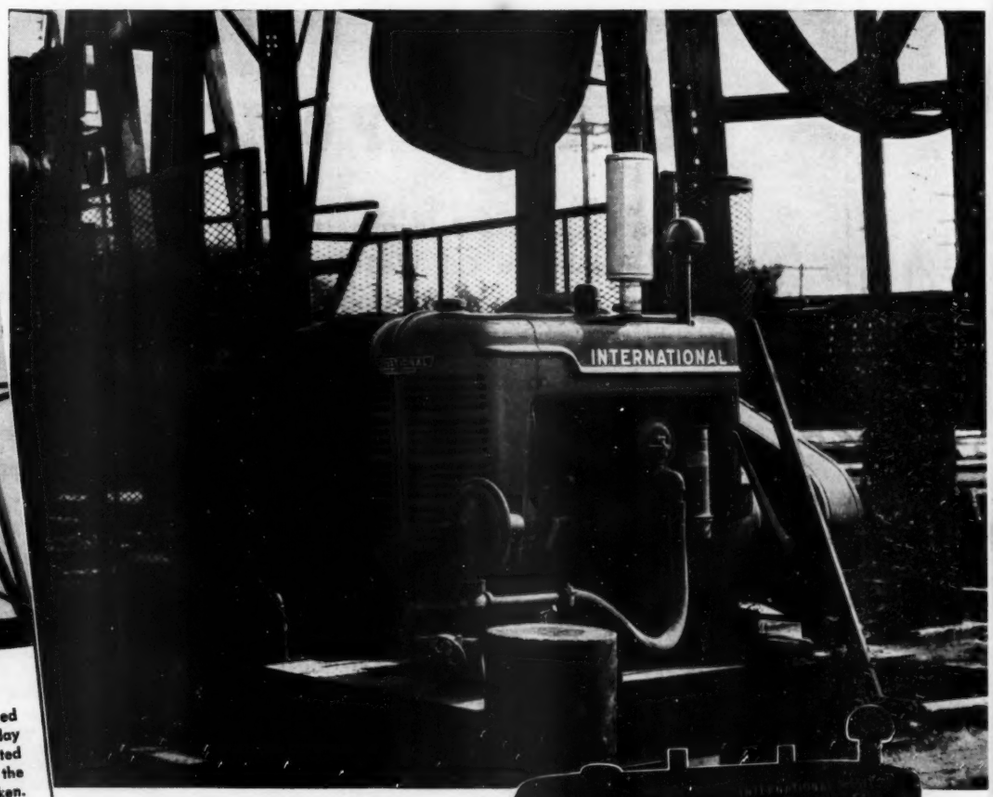
Make your power dollars go farther this year—and in the years ahead—with International Power Units. There is a complete line for every type of fuel—gasoline, natural gas, distillate, and Diesel. Sizes range up to 110 h.p. For loads requiring more power, two or more units can be installed and cut in and out as requirements vary.

There is an International industrial power dealer or Company-owned branch near you, ready to help you solve your power problems. We will also be glad to mail you a power unit catalog on request.

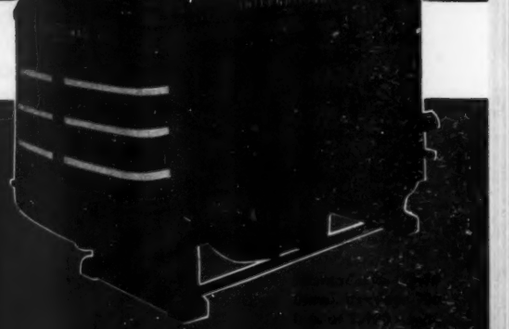
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago, Illinois

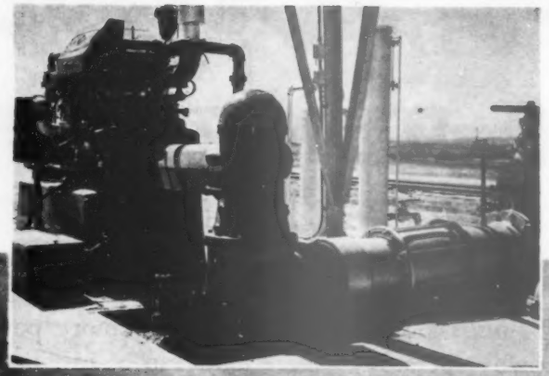
'WAY DOWN . . . 8,540 FEET!

This 6-cylinder International PA-100 Power Unit (110 max. h.p.) owned by Pettijohn Drilling Co., Los Angeles, is pumping 200 barrels a day of 32.5 gravity oil with a 1½-inch pump at 8,540 feet. The well, located at Imperial and Western Blvds., Los Angeles, was reported to be the deepest pumped well in the world at the time these pictures were taken.

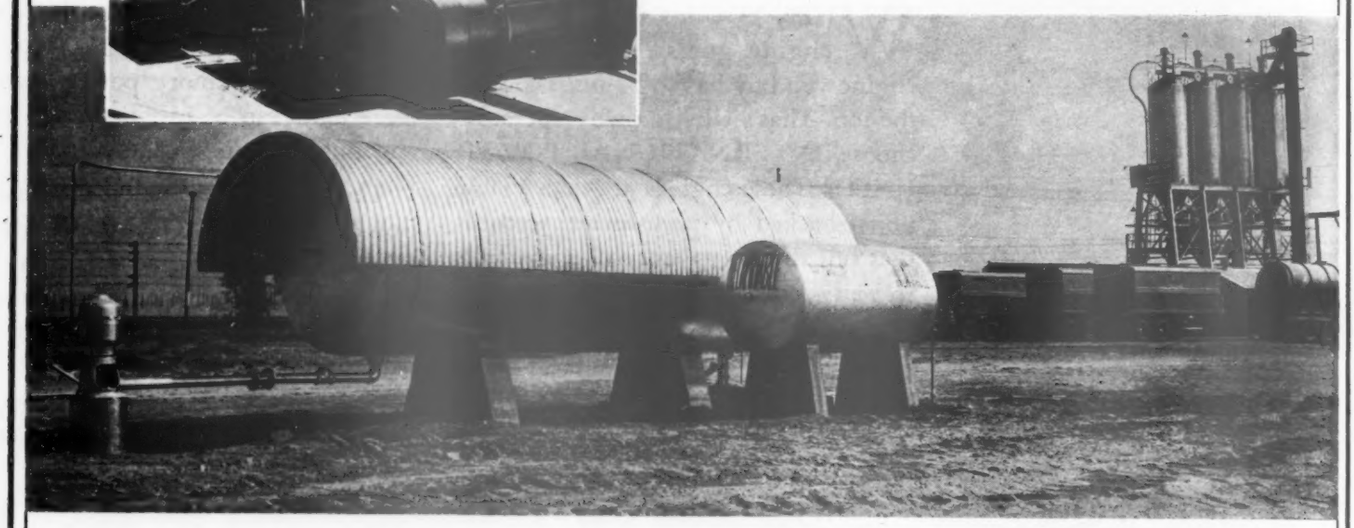


Above: Here's the compact 4-cylinder International U-2 Power Unit operating on natural gas. This engine develops 22 h.p. (on gasoline) at 1,800 r.p.m.





IN EVERY OIL FIELD OPERATION



RELY ON POMONA FOR WATER

North of Bakersfield, California, is a plant of the Halliburton Oil Well Cementing Company, where water in large quantities must be available under pressure for plant operations. Here a 3 H. P. Pomona Little Chief Pump, with a 140 foot setting is being used to furnish water for a 2000 gallon pressure tank, against a shut-off pressure of 60 pounds. This pump, often operating day and night at full load, has never failed to deliver water when wanted and has not cost Halliburton a cent for repairs.

At Coles Levee, California, is a deep well Pomona Turbine pump supplying water for the entire field. This particular installation is a 25 H. P. geared drive, directly connected to a Hall-Scott gas engine.

Major operating companies, refineries, independents and contractors in every field in the United States and in most foreign fields use Pomona Pumps for water supply, transfer, condensate handling and sump pumping. The compactness of the unit—the adjustability of the pump for different settings and capacities, as well as the low operating cost, recommend Pomonas wherever water pumps are needed.

There is a Pomona distributor in every field. See him today, or write us direct.

POMONA
Water-Lubricated
PUMPS

POMONA PUMP CO., 120 Broadway, New York City. Plants at 4301 So. Spring Ave., St. Louis, Mo. and 206 Commercial St., Pomona, California.

OKLAHOMA CRUDE-OIL PRODUCTION—JANUARY-DECEMBER 1940, INCLUSIVE

WASHINGTON COUNTY—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Miscellaneous	1,236,153	3,377	80,600	101,152	105,927	102,960	107,539	101,430	111,301	107,795	99,304	111,669	95,480	110,996
NOWATA COUNTY—														
Miscellaneous	4,306,064	11,765	304,544	346,550	363,103	358,890	371,814	356,940	365,017	366,907	356,984	384,591	345,903	384,821
ROGERS COUNTY—														
Miscellaneous	761,712	2,081	43,617	58,957	66,960	62,670	65,162	60,810	68,406	68,868	65,069	70,668	59,307	71,218
OSAGE AND EASTERN KAY COUNTIES—														
Burbank	2,838,430	7,775	205,716	208,887	236,375	239,190	246,667	238,770	252,078	252,588	233,190	253,859	240,270	230,840
South Burbank	2,927,350	7,998	268,894	251,314	267,282	254,700	255,812	239,790	249,302	249,767	214,500	227,075	220,350	228,564
Naval Reserve	1,288,130	3,519	117,831	105,415	114,576	115,110	115,382	105,720	111,321	105,245	98,700	102,579	94,830	101,421
Other Osage pools	4,615,778	12,611	358,298	373,984	401,295	392,160	402,783	380,670	418,345	342,736	355,020	406,224	378,480	405,783
TULSA COUNTY—														
Miscellaneous	1,064,594	2,908	87,265	86,971	90,582	88,710	95,604	87,720	94,984	89,993	85,110	90,706	81,540	85,409
WAGNER COUNTY—														
Miscellaneous	253,780	693	19,065	18,183	19,592	20,700	19,189	19,770	22,537	22,351	22,890	25,606	20,910	22,988
OKMULGEE COUNTY—														
Miscellaneous	1,410,240	3,853	182,466	117,972	122,636	108,540	113,367	109,110	116,994	112,344	99,846	117,211	103,830	105,924
MUSKOGEE AND McINTOSH COUNTIES—														
Miscellaneous	291,601	797	19,778	23,084	19,654	24,480	28,427	25,230	26,846	25,451	21,480	26,846	24,900	25,425
OKFUSKEE COUNTY—														
Miscellaneous	1,186,770	3,243	68,572	82,215	99,417	85,830	103,385	95,580	109,244	111,228	104,610	109,585	107,460	109,644
SEMINOLE, HUGHES, POTTAWATOMIE, AND PONTOTOC COUNTIES—														
Seminole City	2,500,602	6,832	219,635	212,947	227,974	218,130	221,557	205,200	212,784	207,173	200,730	194,680	187,110	192,682
East Seminole	426,598	1,166	37,324	33,553	34,751	39,510	41,509	34,620	39,711	36,704	32,130	33,666	30,570	32,550
West Seminole	489,452	1,337	41,013	38,744	41,044	38,880	42,780	41,640	42,129	41,912	39,840	40,052	41,520	39,808
Earlsboro district	3,729,866	10,190	355,508	302,499	332,289	314,610	318,897	290,970	309,070	299,770	289,110	324,322	285,150	307,671
Little River, E. Little River and W. Little River	2,875,401	7,610	245,272	237,365	246,264	247,500	250,232	234,540	246,760	238,917	229,440	232,407	232,770	233,934
Searight and E. and N. Searight	775,748	2,120	69,967	70,383	71,579	67,350	67,022	63,600	64,077	60,388	61,410	62,186	56,190	61,596
Mission	459,793	1,256	39,773	38,019	39,339	39,660	40,982	36,630	38,781	37,727	36,060	37,107	37,740	37,975
Carr City	839,883	2,295	75,485	69,861	73,780	71,100	73,780	71,370	71,951	70,618	65,520	65,503	65,040	65,875
Maud	203,913	557	18,724	18,096	19,592	16,410	18,259	17,010	16,647	17,484	15,330	16,616	13,470	16,275
Bowlegs	2,464,267	6,732	220,255	204,450	214,272	209,250	212,226	200,700	206,305	209,250	199,320	197,563	193,500	197,176
Dora	741,209	2,025	66,185	60,407	62,682	67,530	76,446	68,400	68,665	62,496	55,920	54,250	46,830	51,398
Total Seminole	15,506,732	42,368	1,389,141	1,286,324	1,363,566	1,329,930	1,363,690	1,264,680	1,316,880	1,284,390	1,224,810	1,258,352	1,189,890	1,239,030
Asher and W. Asher	122,342	334	9,176	9,483	10,819	8,820	11,563	10,980	10,354	10,261	10,530	10,633	8,940	10,783
Allen district	2,065,591	5,643	189,224	184,237	198,462	168,060	174,964	169,800	174,840	169,973	162,810	165,664	155,130	152,427
Beebe and E. Beebe	1,827,956	4,994	90,675	123,975	151,311	156,930	170,283	160,230	161,107	173,507	166,800	162,517	149,790	160,831
Bethel and N. Bethel	756,728	2,064	70,143	64,322	67,518	65,070	67,642	64,050	62,403	61,783	59,490	60,016	54,600	59,681
Cromwell, N., and E. and S. Cromwell	1,356,714	3,707	87,110	88,247	92,969	96,510	107,849	101,730	113,615	108,221	117,570	148,056	146,670	148,167
Dill	634,852	1,735	27,683	25,375	27,900	22,950	41,137	38,940	37,913	52,483	55,170	81,809	112,800	110,692
Fish	1,152,670	3,147	99,820	97,034	105,772	98,160	96,627	96,900	97,867	97,216	90,210	92,008	88,800	92,256
Fitts	6,246,313	17,066	629,083	581,102	601,958	557,520	542,593	523,680	500,216	472,719	466,830	471,138	430,320	469,154
Gray	297,272	812	24,552	22,272	24,738	23,580	22,723	24,150	26,505	25,234	25,800	26,040	25,080	26,598
Holdenville	252,936	691	20,522	19,749	22,754	22,500	21,266	21,870	22,258	19,933	20,550	21,421	18,750	21,363
Jesse	781,570	2,135	66,526	65,163	69,874	66,030	66,650	64,200	68,045	65,193	61,860	62,992	61,380	63,657
Keokuk	1,090,558	2,980	99,262	93,177	97,464	93,090	98,673	93,990	94,705	87,110	84,300	89,249	61,380	79,528
Sasakwa townsite	130,692	357												
Konawa, E., S. and W. Konawa	765,510	2,092	11,315	11,716	10,850	9,720	9,610	10,950	11,873	11,377	10,920	11,160	9,930	11,271
Olympic	739,280	2,020	65,658	65,192	74,958	70,770	67,673	59,370	60,326	58,311	54,780	65,875	55,830	66,767
Shawnee	808,658	2,209	69,998	68,469	66,743	65,610	65,937	58,200	65,007	59,613	56,940	54,994	52,770	54,999
St. Louis	9,330,579	25,603	55,149	52,084	62,682	75,420	68,944	68,400	72,602	75,299	67,380	71,424	67,440	71,834
Sasakwa	426,192	1,164	952,878	890,039	915,864	717,210	866,326	779,340	783,680	728,841	689,190	686,278	643,800	677,133
Papoose	229,852	628	40,269	36,830	38,254	36,930	37,075	35,220	35,371	33,852	33,870	33,449	31,170	33,901
Wofford	30,101	89	19,561	18,531	19,747	19,770	20,088	18,450	19,964	19,003	19,050	18,879	17,880	18,929
Wetley	34,244	94	3,813	2,726	2,573	2,340	2,511	2,280	2,449	2,449	2,280	2,387	1,950	2,343
Wewoka district	607,597	1,660	3,720	2,697	2,976	2,910	3,255	2,430	2,573	2,542	2,640	3,038	2,520	2,943
Grayson	378,688	1,035	46,562	51,910	56,358	52,650	52,235	50,070	50,375	51,956	48,390	51,894	46,620	48,577
Traugh	227,892	623	38,471	37,149	35,030	33,990	32,612	29,520	31,806	29,233	27,990	28,489	25,890	28,508
Adams	269,632	737	22,134	20,445	22,227	20,760	20,584	17,700	11,842	18,755	17,310	20,274	16,470	19,391
Hazel	90,843	248	22,568	21,982	22,940	22,200	22,785	22,230	22,599	22,909	22,290	22,816	21,990	22,323
Avoca	367,228	1,003	10,137	9,048	9,920	8,310	7,192	7,920	6,789	6,634	6,030	5,828	6,450	6,585
King and W. King	227,112	621	30,876	29,348	30,907	29,730	30,845	30,270	33,449	34,038	32,250	29,729	27,540	28,246
Sacred Heart	143,253	391	24,335	26,941	23,591	22,380	26,381	27,270	29,357	20,367	10,320	6,200	4,290	5,680
Rosanna	200,129	547	33,573	19,430	15,438	14,640	8,835	7,380	9,827	7,750	6,900	6,820	5,760	6,900
Miscellaneous	397,126	1,085	26,102	22,098	22,103	19,740	17,375	14,970	14,811	13,392	12,900	12,090	10,710	11,838
CREEK COUNTY—			34,844	34,974	38,409	32,550	30,070	28,950	31,248	30,721	30,450	35,216	34,500	35,194
Glenpool, Sapulpa district	1,458,889	3,986	113,646	130,413	124,868	128,340	131,998	113,760	122,884	121,427	110,700	124,620	113,550	122,683
Cushing-Shamrock	3,352,616	9,160	267,468	265,321	285,727	282,990	293,539	272,040	292,826	287,277	267,630	286,905	263,790	287,103
Bristow-Slick district	2,212,927	6,046	194,339	176,871	189,410	187,590	189,906	181,770	193,967	191,239	174,570	187,240	165,570	180,455
Manford and Olive	596,143	1,629	51,739	49,967	50,778	51,120	49,321	48,420	54,870	51,770	47,550	47,182	45,600	47,826
Mounds	90,916	248	8,680	7,395	7,037	8,610	7,905	8,250	8,215	6,851	6,840	7,750	6,180	7,203
Wilcox	182,490	499	16,027	15,776	15,469	15,300	16,523	14,850	15,593	15,190	13,110	15,283	14,100	15,269
Independent	82,446	225	13,919	11,513	10,726	8,760	8,525	5,460	9,083	2,418	2,430	3,782	2,820	3,010
Miscellaneous	359,398	922	4,588	9,918	22,909	22,470	25,947	27,540	32,488	43,493	49,590	42,470	38,400	39,585
PAWNEE AND PAYNE COUNTIES—														
Yale district, Maramec and Jennings	1,037,055	2,833	79,267	90,654	94,860	94,830	96,658	82,770	86,614	84,103	80,010	84,103	78,990	84,196
Ramsey	1,376,640	3,761	135,966	110,664	117,335	114,360	117,428	112,740	116,095	114,421	109,440	111,569	105,270	111,352
Broyles	65,728	180	5,642	6,554	3,782	3,660	8,184	8,790	4,247	5,487	4,860	5,146	4,290	5,086
Watchorn	142,488	390	12,183	10,150	10,788	11,160	12,245	10,740	12,059	13,578	12,660	12,524	11,610	12,791
Cleveland-Keystone	301,726	824	28,861	26,564	28,055	26,850	25,203	24,630	26,009	24,986	21,390	22,072	23,010	24,096
N. Teriton	80,491	219	5,735	5,974	6,479	6,570	8,959	6,690	7,378	7,161	6,180	6,386	6,510	6,469
Lauderdale	294,401	804	25,699	24,621	24,583	23,790	26,753	23,370	26,691	25,296	21,540	24,087	23,010	24,961
Coyle	636,961	1,740	62,620	46,574	50,933	52,050	46,624	48,900	47,616	44,330	44,130	46,221	62,340	84,623
Norfolk and W. Norfolk	113,141	309	9,083	8,671	9,238	9,390	9,486	9,210	10,168	9,517	9,060	9,734	9,720	9,864
Garr	140,166	383	11,160	10,411	11,253	11,790	12,183	11,670	12,245	12,338	11,490	12,121	11,220	12,285
Miscellaneous	240,436	657	11,780	12,441	22,475	18,450	21,142	15,510	19,561	18,755	18,780	26,195	27,546	27,807
LINCOLN COUNTY—														
Sac and Fox	707,171	1,932	81,127	72,500	70,556	65,250	63,364	55,440	55,428	49,383	48,720	49,941	45,570	49,892
Peck	54,495	149	4,774	4,495	4,495	4,410	5,425	4,560	4,805	3,937	5,022	3,360	4,590	4,622
Chandler and Hoyt	402,342	1,099	35,960	34,829	33,728	34,680	34,193	30,750	33,325	34,162	33,090	33,449	30,690	33,486
Stroud and Skellyville	169,636	463	12,555	12,499	12,896	15,060	14,043	14,130	14,849	15,128	15,030	14,663	13,860	14,923
Wilzetta and S. Wilzetta	197,973	540	22,010	19,082	20,522	19,890	17,763	15,450	15,500	14,756	13,980	13,144	12,150	13,726
Lafoon	248,984	680	19,561	18,908	22,537	27,540	23,064	21,960	22,878	19,406	19,110	17,825	17,970	18,135
Perkins	108,533	297				11,070	15,314	12,240	11,6..5	11,656	12,600	11,439	10,440	12,149
Sparks	81,012	221	5,239	5,568	5,704	5,520	6,076	4,230	5,332	9,393	7,980	9,455	7,050	9,465
Wellston, N.	121,468	332	15,531	13,543	14,787	10,920	11,625	8,700	8,277	8,339	7,890	8,215	6,360	7,281
Davenport	169,994	464	13,144	13,079	15,004	13,530	14,942	12,960	14,787	14,663	14,790	14,632	13,680	14,783
Miscellaneous	91,451	250	6,541	4,727	5,053	7,560	9,858	8,220	8,339	8,184	8,100	8,401	7,950	8,518
OKLAHOMA COUNTY—														
Oklahoma City	35,970,314	98,279	3,063,203	2,881,237	2,986,199	2,898,510	3,088,437	2,990,370	3,120,243	3,094,017	2,940,150	2,940,133	2,843,490	3,124,325
Edmond	1,488,027	4,066	130,014	123,772	135,160	133,170	130,045	120,870	117,645	125,798	119,010	122,915	109,800	119,828
Britton and S. Britton	252,598	690	17,236	24,331	27,032	25,500	24,242	19,950	20,274	18,972	17,220	20,925	16,080	20,836
Miscellaneous	51,568	141	2,170	2,900	2,232	3,750	5,053	4,020	6,045	5,611	5,250	5,208	4,710	4,619
CLEVELAND COUNTY:														
Moore	599,446	1,638	65,271	54,433	64,201	64,740	55,273	55,620	52,824	48,205	38,160	35,185	32,610	34,924
Miscellaneous	675	2			279		186						210	
KAY, GRANT, AND NOBLE COUNTIES—														
Blackwell, Deer Creek, Caldwell and Webb	255,025	697	25,823	21,663	25,079	23,160	23,343	22,320	7,595	21,297	21,480	21,111	20,760	21,394
Dilworth	151,899	415	12,524	13,108	13,764	13,710	13,082	12,720	12,276	12,369	12,480	12,648	10,470	12,748
Lamont	212,018	579	11,687	10,063	13,144	14,070	12,958	16,650	46,159	52,018	1,980		16,470	16,819
Ponca City	96,694	264	7,750	7,047	7,378	8,640	8,525	7,830	8,680	8,525	7,650	8,153	8,220	8,296
Braman, N. Braman, and S.E. Braman	506,642	1,384	42,563	39,092	43,586	30,180	49,693	44,820	47,585	41,633	41,280	42,935	40,260	43,015
Hubbard	183,771	502	14,911	15,921	16,616	15,240	15,159	14,400	16,027	15,283	14,400	15,841	14,010	15,963
Thomas	78,408	214	6,572	6,322	6,293	6,780	6,851	5,700	6,417	6,541	6,570	7,130	5,970	7,262

OKLAHOMA CRUDE-OIL PRODUCTION (Continued)

Tonkawa	623,796	1,704	47,988	48,314	51,894	53,010	56,761	49,530	54,529	53,630	52,230	52,669	50,460	52,781
Billings	2,209,087	6,036	180,730	170,317	181,784	178,800	185,783	180,780	187,953	189,038	183,930	193,967	186,960	189,045
Lucien	2,750,180	7,514	254,107	234,813	248,310	240,210	247,846	238,470	241,180	224,936	209,160	211,234	192,990	206,925
N. Lucien	235,264	752	21,111	20,358	21,731	22,230	23,219	17,220	15,035	23,498	19,350	17,825	14,850	18,837
Vernon	96,843	265	7,316	7,395	7,378	7,770	7,936	7,440	9,238	8,618	7,950	9,052	7,650	9,100
Polo	386,968	1,057	34,627	30,160	36,239	37,980	35,805	31,350	35,185	28,799	26,730	31,031	27,900	31,162
Miscellaneous	61,171	167	3,162	7,453	5,518	6,810	7,440	5,490	3,472	3,255	5,040	3,844	4,590	5,097
GARFIELD COUNTY—														
Garber	632,183	1,727	53,196	48,662	51,491	54,930	53,072	53,220	57,753	52,576	52,020	53,475	48,270	53,518
Miscellaneous	114,770	314	5,394	6,061	6,386	3,870	4,309	4,080	4,278	5,910	5,115	6,030	4,170	59,167
LOGAN COUNTY—														
Crescent	769,125	2,101	63,333	59,943	77,500	67,020	75,671	62,580	66,588	54,870	53,040	65,162	59,610	63,808
Langston and S. Langston	121,113	331	12,369	10,875	11,005	8,820	7,719	8,100	8,463	9,982	7,680	9,548	13,650	12,902
Marshall, Lovell, and Seward	124,079	339	10,323	8,468	9,734	9,330	9,889	11,610	12,152	11,718	10,920	11,718	7,350	10,867
Meridian and misc.	119,899	328	12,772	10,962	12,958	12,450	6,696	5,730	8,029	7,409	6,420	12,940	11,640	11,893
STEPHENS AND COTTON COUNTIES—														
Duncan district	1,046,361	2,859	77,190	83,839	85,653	91,020	91,822	78,510	89,559	92,721	84,870	90,830	84,720	95,627
Loco-Milroy	266,748	729	21,142	19,807	23,157	23,220	23,839	22,080	23,498	22,165	22,290	22,754	19,980	22,816
Velma	266,834	729	17,608	21,808	21,731	22,560	23,126	22,230	25,823	23,684	22,290	22,940	19,920	23,114
Walters	333,654	912	23,436	27,666	29,822	27,420	29,605	25,770	28,768	28,241	28,410	29,109	25,920	29,487
Comanche	198,026	541	15,221	15,979	13,795	17,820	16,058	18,450	20,026	16,399	15,570	16,399	15,840	16,469
Miscellaneous	45,135	123	3,441	928	3,472	3,300	3,441	3,570	5,115	4,743	4,740	4,495	3,390	4,500
CARTER COUNTY—														
Healdton	3,177,027	8,680	265,174	257,346	275,683	268,860	278,504	262,440	271,746	268,398	257,490	261,671	249,990	259,725
Hewitt	1,778,272	4,859	114,452	114,550	114,762	120,330	119,319	114,510	127,689	149,761	156,750	189,937	227,070	229,142
Sholem-Alechem	1,002,678	2,740	85,374	84,419	85,901	87,570	89,838	82,710	90,086	82,615	77,910	79,918	76,530	79,807
Wildcat Jim	167,832	459	14,601	13,224	13,950	13,890	13,857	13,530	14,477	13,826	13,830	14,322	13,920	14,405
Tussey	500,971	1,369	.....	.....	12,369	12,150	.....	4,200	38,626	39,990	73,410	91,884	113,700	114,642
Tatums	664,980	1,817	52,979	58,899	54,126	58,470	57,722	58,980	63,209	61,659	52,560	54,250	46,020	46,106
Graham, Fox, and Ed Cox	933,499	2,551	88,784	70,934	70,463	80,730	89,032	80,940	83,390	77,004	72,240	74,431	71,070	74,481
Brock	93,071	254	7,254	7,917	8,432	7,770	7,688	7,770	7,812	7,874	7,710	7,750	7,380	7,714
Miscellaneous	17,706	48	1,488	1,450	1,581	1,710	1,643	1,650	1,209	1,767	1,950	558	1,200	1,509
KIOWA COUNTY—														
Miscellaneous	10,814	30	6,882	812	.....	.....	.....	.....	.....	.....	.....	.....	3,120	.....
COAL COUNTY—														
Miscellaneous	33,716	92	3,100	2,958	3,193	2,970	2,914	3,090	3,317	2,542	2,820	2,201	2,220	2,391
LOVE COUNTY—														
Stockton	5,439	14	1,085	.....	1,209	.....	.....	.....	.....	.....	540	155	1,170	1,280
JEFFERSON COUNTY—														
Miscellaneous	687,738	1,879	57,753	57,884	58,590	57,750	64,449	55,590	56,885	55,459	54,540	56,234	56,280	56,324
GARVIN COUNTY—														
Robberson	202,340	553	29,915	28,420	30,535	27,810	30,070	.....	.....	.....	28,170	.....	27,420	.....
GRADY COUNTY—														
Knox	717,337	1,959	53,599	55,506	57,815	65,100	67,580	57,750	60,047	61,535	56,910	62,527	55,830	63,138
MARSHALL COUNTY—														
Miscellaneous	449,933	1,229	3,875	3,306	5,704	24,300	4,278	4,320	5,611	55,800	63,450	88,133	94,230	96,926
TILLMAN COUNTY—														
Frederick	621,540	1,698	41,447	42,340	47,988	48,240	46,097	43,080	43,114	47,523	51,030	60,884	74,580	75,217
JACKSON COUNTY—														
Altus	728,631	1,991	61,194	58,580	62,279	62,250	64,294	59,610	63,674	63,395	57,960	59,024	57,180	59,191
CADDO COUNTY—														
Cement	2,468,689	6,745	200,787	164,111	196,664	217,800	214,210	189,720	201,004	209,498	225,510	216,380	212,160	220,845
COMANCHE COUNTY—														
Miscellaneous	5,219	14	496	174	124	150	961	810	527	496	420	341	270	450
McCLAIN COUNTY—														
Byars	285,974	781	11,408	.....	86,986	96,510	48,546	13,110	10,416	4,402	1,920	3,906	4,650	4,120
Total	149,597,199	.....	12,710,217	12,132,962	12,934,936	12,494,610	12,971,206	12,158,700	12,724,038	12,493,036	11,954,090	12,424,980	11,881,670	12,716,754
Daily average	408,736	.....	410,007	418,378	417,256	416,487	418,426	405,290	410,453	403,001	398,470	400,806	396,056	410,218

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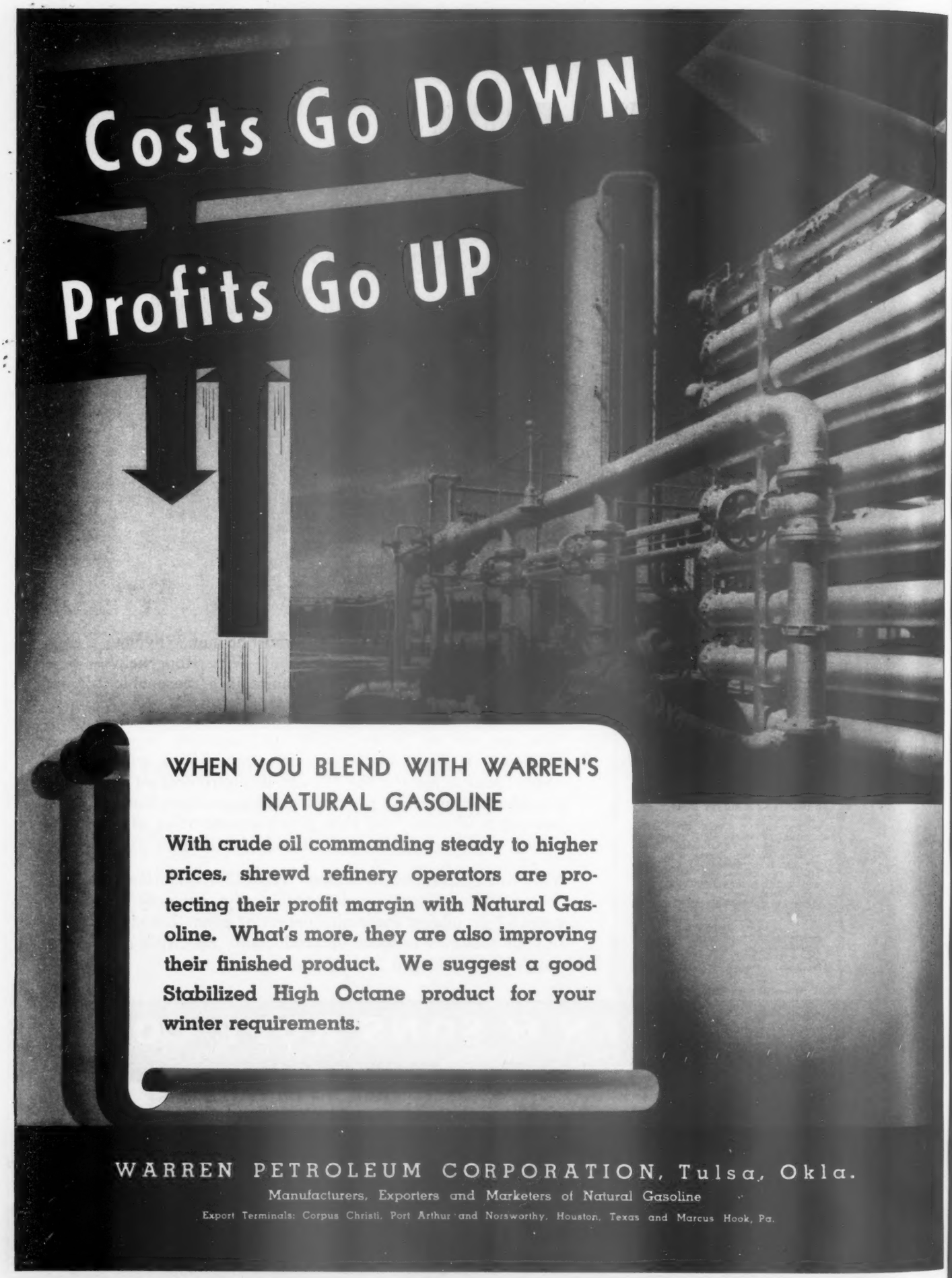
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from the main Hewitt pool by a number of dry holes, and dry holes also separate it from the Healdton field to the west. Producers have been ranging from 50 to 55 bbl. daily, and activity, which for a few weeks was the highest in the state, is expected to continue well into the new year. Some observers believe the Healdton and Hewitt fields will be joined.

Second to Okfuskee County in the number of discoveries for the year (six) was Creek County with five. Lincoln County had four, Payne County three, Logan and Osage counties two each, Pottawatomie two, including the Romulus pool in the St. Louis district, and Seminole, Coal and Garfield each had one. Altogether there were 30 new pools opened which are listed in the accompanying table.

Several other wells that were drilled as wildcats found production, but later were classed as adding extensions to older pools. Two of these extended the West Earlsboro pool in Pottawatomie County and Winona Oil Co. completed a 750-bbl. producer which was classed as a north extension to the Fish pool in Seminole County. Another Seminole County outpost which gave promise at midyear of opening a new pool found production but was classed as an extension to West Little River pool.

Other pools extended during the year were Jackson in Seminole County; Okemah, Okfuskee County; Gray, Pottawatomie County; Skellyville and Wilzetta, Lincoln County, and Calvin, Hughes County.

Plug-Back Operations

Operators in the Ramsey pool of Payne County began plugging back late in the year to the Hunton lime after producing for 2 years from the Wilcox. Results, however, were not as promising as was first believed after the good results obtained from the same procedure in nearby Coyle pool. Mid-Continent Petroleum Corp. plugged back 1 Nottingham, NW SE 18-18-2e, an on test pumped 62½ bbl. of oil and 15 bbl. of salt water. In spite of the show of salt water, operators are continuing to test and the plugging back may become extensive as it did in the Coyle pool.

The Coyle pool, which, since its discovery in 1938, has produced nearly 100,000 bbl. of oil from the Wilcox, is proving highly productive from the Hunton and wells are being plugged back rapidly and the new horizon has yielded up to 190 bbl. an hour on tests. There was also considerable new drilling in the Coyle pool with the Hunton as the objective, which may be expected to continue into 1941.

Cumberland Pool

Although the northwest and southeast ends of the Cumberland pool were indicated by two small wells completed in December, exact limits are still unknown and development will continue for some time to come. Fifteen wells were completed by year's end, two others were near completion and several others drilling or located.

The Cumberland discovery, highlight of the year, was made by Pure Oil Co. Pure holds a lease block of approximately 23,000 acres in the area. The discovery well was spudded early in 1939 on the Quentin Little lease after a thorough geological and geophysical study and both drilling operations and formations were studied closely. Operators found oil in the Tulip Creek sands, topped at 4,952 and 5,088 ft., in March, but passed up three zones at the time to drill deeper.

The hole was carried to total depth of 5,640 ft., then was plugged back and completed in April in the Tulip Creek zone for an initial potential of 4,542 bbl. of oil daily, with gas gaging as high as 25,000,000 cu. ft. A big lease and royalty play followed the finding of oil in the Tulip Creek sand, and other companies are expected to take part in the development.

Interest in the pool intensified late in the summer when two more pay zones were discovered. Both upper and lower Bromide zones which run higher than the Tulip creek sand were proven productive. The Thomas 102, which opened the upper Bromide in August, was completed at a plug-back depth of 4,924 ft. for 653 bbl. of oil in 18 hours flowing through tubing.

The Marshall County strike and discoveries across the Red River in several northern Texas counties encouraged prospecting in the southern section of Oklahoma and increasing attention will be paid to the area as time goes on.

St. Louis Pool

The year also was marked by the increase of sec-

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ondary recovery methods in many areas, and particularly the widespread use of large-volume pumps in the St. Louis pool to handle the water which has encroached into the Simpson dolomite.

This method of recovering trapped oil which otherwise was lost, not only increased production of existing wells in the pool, but also, from time to time, has been responsible for new drilling. The large-volume pumps, by handling tremendously increased amounts of fluid, raise the oil-water ratio to a point that establishes profitable production in wells formerly described as "drowned out."

Possibility of renewed drilling in the St. Louis pool was seen as the result of operations on Reda Pump Co. 1 Lucas in NW 2-6-4 which had produced for almost 2 years on a centrifugal pump, was then put on the beam after oil recovery dropped below an economic point, and was revived in November with an even larger centrifugal pump.

One noteworthy development of the year was the drilling of the state's deepest hole, Continental Oil Co. 1 Proctor, C NW 28-10-20w, in Washita County. The hole was bottomed at 14,582 ft., but was given up as a failure early in January.

Field Developments in 1940

County or field—	No. of wells— Jan. 1, 1940	Dec. 31, 1940
Northeastern counties	15,813	15,550
Osage and eastern Kay:		
Burbank S. Burbank	1,748	1,702
Naval Reserve	241	239
Others	242	238
Tulsa	6,340	6,153
Wagoner	3,452	3,412
Okmulgee	591	488
Muskogee and McIntosh	2,198	2,167
Okfuskee	564	543
Seminole, Hughes, Pottawatomie and Pontotoc:	391	412
Seminole City	212	206
E. and W. Seminole	119	124
Earlsboro district	353	346
Little River, E. & N.	325	319
Searight, E. & N.	84	79
Mission	70	66
Carr City	85	84
Maud	60	57
Bowlegs	232	223
Dora	98	108
Asher & W.	42	41
Allen	499	506
Beebe & E.	199	246
Bethel & N.	67	64
Cromwell, N. & E. & S	260	275
Dill	32	49
Fish	123	134
Fitts	907	866
Gray	23	26
Holdenville	124	118
Jesse	68	66
Keokuk	103	101
Sasakwa townsite	8	8
Konawa, E. & W. & S.	129	138
Olympic	336	332
Prague	0	9
Shawnee	37	58
Romulus	0	3
St. Louis	888	893
Sasakwa	62	59
Papoose	58	58
Wofford	5	4
Wetley	17	17
Wewoka	140	132
Grayson	36	35
Traugh	36	39
Adams	10	10
Hazel	20	21
Avoca	8	10
King & W. King	5	9
Sacred Heart	6	9
Rosanna	21	20
Misc.	133	123
Creek:		
Glenpool, Sapulpa	1,970	1,956
Cushing-Shamrock	1,874	1,824
Bristow-Slick	923	913
Mannford & Olive	477	471
Mounds	53	51
Wilcox	64	58
Independent	44	44
Misc.	666	654
Pawnee and Payne:		
Yale, Meramec & Jennings	441	440
Ramsey	37	38
Broyles	7	10
Watchorn	15	17
Coyle	24	32
Cleveland-Keystone	495	490
N. Terlton	78	76
Lauderdale	204	198
Norfolk & W.	40	36
Garr	33	34
Misc.	72	71
Oklahoma:		
Oklahoma City	1,020	1,009
Edmond	95	84
Britton & S.	30	31
Misc.	4	6
Lincoln:		
Sac and Fox	135	140
Peck	3	3
Chandler & Hoyt	64	61
Stroud & Skellyville	42	42
Wilzetta & S.	13	15
Laffoon	9	11
Perkins	0	3
Sporn	10	6
Wellston	31	25
Davenport	124	119
Misc.	16	19
Stephens and Cotton:		
Duncan	489	494
Loco-Milroy	211	206
Velma	627	635
Walters	253	248
Comanche	158	159
Misc.	34	33
Cleveland:		
Moore	39	38
Misc.	2	1
Kay, Grant and Noble:		
Blackwell, Deer Ck. Caldwell & Webb	59	59
Dilworth	85	76
Lamont	2	2
Ponca City	37	40
Braman & N. & S.E.	99	94
Hubbard	38	36
Thomas	17	14
Tonkawa	313	212
Billings	79	85
Lucien	124	123
N. Lucien	10	12
Vernon	18	16
Polo	33	32
Misc.	26	25
Garfield:		
Garber	584	572
Misc.	17	18
Logan:		
Crescent	47	41
Langston & S.	13	14
Marshall, Lovell & Seward	35	33
Meridian & Misc.	10	12
Carter:		
Healdton	1,929	1,909
Hewitt	766	798
Sholem-Alechem	318	319
Wildcat Jim	88	88
Tussey	83	83
Tatums	220	220
Graham-Fox-Ed Cox	427	417
Brock	127	127
Misc.	3	3
Kiowa Co.	4	10
Coal	5	5
Love	1	1
Jefferson	173	174
Garvin	183	176
Grady	158	169
Marshall	160	173
Tillman	103	111
Jackson	116	148
Caddo	285	321
Comanche	7	7
McClain	1	10

Southwestern Oklahoma

The Cement field in Caddo County was one of the busier areas of the state with an extension to the west and the tapping of some new pay zones. As many locations within the recognized limits of the field remain to be drilled, it is apparent that drilling will continue for some time to come.

Caddo County, due largely to the activity in the Cement field, had 94 completions during the year, nearly double the number of 1939. Of the total completions, 53 were oil wells, compared to 35 in the county in 1939.

Pottawatomie County dropped from its position in 1939 as the busiest county in Oklahoma, due largely to the fact that activity in the St. Louis pool fell off in spite of more favorable prospects for drilling. It held second place, however, with 147 completions. During the first 6 months, Pottawatomie was still the most active county, but drilling was almost completely shut off in the last 6 months.

Creek County activity also showed a decrease from 206 completions in 1939 to 163 in 1940. A lessening of activity was also noticeable in Seminole County with 184 completions in 1939 and only 129 in 1940. The same was true of Pontotoc which dropped from 122 completions in 1939 to 11 in 1940. The bulk of the activity in Pontotoc County in 1940 was in the Bebee pool, while the nearby South Konawa pool was one of the busier areas of Seminole County.

In spite of the sizable drop in completions in counties which led the activity in 1939, the overall activity for the state jumped in 1940 considerably with a total of 1,834 completions as compared to 1,761 for 1939. Of the total 1940 completions, 1,011 were oil wells with an aggregate initial production of 205,834 bbl. daily. Daily production failed to show a corresponding increase over 1939 when it amounted to 205,367 bbl.

Most of the gain in activity in 1940 over the previous year was noticeable in Okfuskee, Okmulgee and Carter counties where completions were 105, 100 and 116, respectively. This compared with 1939 completions, in the same order, of 57, 66 and 41.

Okfuskee and Okmulgee County activity was due to widespread exploration and to the discovery of small pools, and Dill contributed to the upswing in Okfuskee. Carter County activity was due largely to development of the West Hewitt pool. Gas played a more important part in field work for 1940 than usual, with 166 gas wells completed as compared to 113 in 1939.

Gas discovery wells were completed in Hughes, Jackson, Muskogee, Osage, Okfuskee, Pontotoc and Tulsa counties.

At year's end operations continued strong in Cumberland and development of the Hewitt extension vied with Cumberland for the number of completions. Wildcatting was keeping up apace and rigs were up or drilling in most of the state's oil counties.

Wildcat locations, rigs and drilling wells were reported in 25 counties on January 1 as follows: Caddo, 7; Carter, 15; Creek, 18; Garvin, 1; Grady, 2; Hughes, 2; Jackson, 6; Kay, 15; Kiowa, 2; Lincoln, 5; Logan, 4; Marshall-Bryan, 10; Okfuskee, 15; Oklahoma, 32; Okmulgee, 24; Osage, 6; Pawnee, 5; Payne, 2; Pontotoc, 5; Seminole, 12; Stephens, 8; Tillman, 4; Tulsa, 11; Wagoner, 8.

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	127	68	18,020	46	13
February	130	76	19,082	46	8
March	135	70	12,067	54	11
April	158	86	20,724	59	13
May	180	99	19,656	74	7
June	166	93	17,767	57	16
July	156	63	10,201	76	17
August	201	106	22,704	82	13
September	126	69	10,269	44	13
October	190	109	31,066	59	22
November	163	106	13,848	33	24
December	102	66	10,430	27	9
Total 1940	1,834	1,011	205,834	657	166
Total 1939	1,761	1,045	205,367	603	113
Difference	73	58	467	53	78
Total 1938	1,654		214,978	545	123
Total 1937	2,672	1,852	677,156	697	123

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(Continued from Page 85)

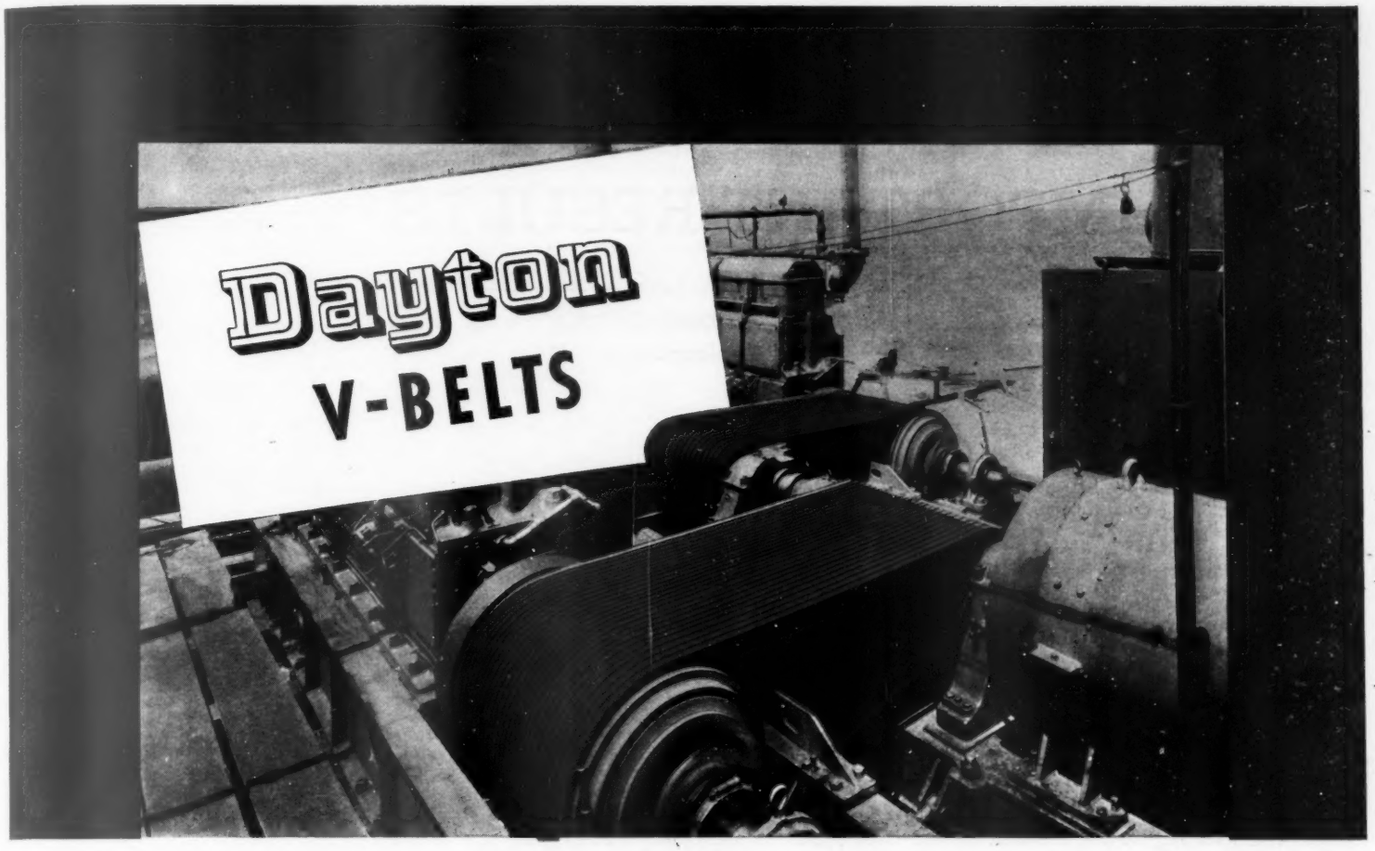
at 8,774-8,815 ft., and cored several other shallower sands capable of producing.

Summary of Field Operations for 1940

Field—	Comp.	Oil	Prod.	Dry	Gas
Abbeville	8	4	1,364	4	0
Anse La Butte	34	22	5,479	12	0
Bancroft	12	11	1,999	1	0
Barataria	10	9	3,162	1	0
Bateman Lake	5	1	129	0	4
Bayou Blue	15	12	2,080	2	1
Bayou Boullion	5	2	162	3	0
Bayou de Glaise	1	1	345	0	0
Bayou des Allemands	2	2	318	0	0
Bayou Pigeon	3	3	1,104	0	0
Bay St. Elaine	8	3	582	5	0
Black Bayou	2	1	522	1	0
Caillou Island	10	7	1,496	3	0
Cameron Meadows	4	3	617	1	0
Chacahoula	5	4	1,643	1	0
Chalkley	18	12	4,770	6	0
Charenton	56	36	3,841	20	0
Cheneyville	18	16	3,988	2	0
China	1	1	40	0	0
Choctaw	4	4	776	0	0
Creole	1	1	145	0	0
Darrow	9	6	1,980	3	0
Delta Farms	3	2	989	1	0
Dog Lake	5	4	436	1	0
Edgerly	3	2	428	1	0
Eola	54	50	23,830	4	0
Erath	6	2	136	4	0
Evangeline	22	19	4,665	3	0
Four Isle	1	0	0	1	0
Fausse Point	14	5	680	8	1
Garden Island	11	11	4,143	0	0
Gibson	4	4	2,475	0	0
Gillis	7	6	769	1	0
Golden Meadow	126	117	25,512	8	1
Grand Bay	14	14	7,638	0	0
Grand Lake	17	17	4,481	0	0
Gueydan	1	1	23	0	0
Hackberry	26	18	6,923	8	0
Happytown	2	1	324	1	0
Horseshoe Bayou	3	2	696	1	0
Iowa	7	5	2,951	2	0
Jeanerette	5	2	924	3	0
Jefferson Island	4	3	751	1	0
Kenilworth	1	0	0	1	0
Lafitte	19	18	10,465	1	0
La Fourche Crossing	4	3	676	1	0
Lake Hermitage	1	0	0	1	0
Lake Long	1	1	275	0	0
Lake Mongoulois	1	1	75	0	0
Lake Pelto	6	2	484	4	0
Lake Salvador	2	2	1,327	0	0
La Pice	2	2	502	0	0
La Place	2	2	96	0	0
Leeville	5	5	1,681	0	0
Little Chenier	1	1	129	0	0
Lockport	1	1	90	0	0
Neale	14	11	3,615	3	0
New Iberia	37	30	10,903	6	1
Nibbletts Farm	1	1	100	0	0
North Crowley	19	17	10,846	2	0
North Elton	2	1	40	1	0
Paradis	7	6	4,660	1	0
Perkins	1	0	0	1	0
Plumb Bob	1	1	540	0	0
Potash	8	6	3,084	2	0
Port Barre	12	9	4,002	2	1
Quarantine Bay	10	9	4,449	1	0
Raceland	4	4	2,002	0	0
Ritchie	3	2	60	0	1
Roanoke	1	1	312	0	0
Section 28	1	0	0	0	1
Sorrento	4	1	10	3	0
South Crowley	3	3	1,330	0	0
South Jennings	4	2	212	2	0
South Roanoke	4	3	736	1	0
Starks	7	2	267	5	0
Stella (Belle Chasse)	2	2	751	0	0
Sulphur	9	7	1,672	2	0
Sweet Lake	5	5	1,397	0	0
University	32	27	5,795	4	1
Valentine	5	4	1,473	1	0
Venice	7	5	1,238	2	0
Vermilion Bay	1	0	0	1	0
Ville Platte	70	69	18,920	1	0
Vinton	2	0	0	2	0
Welsh	2	0	0	2	0
West Cote Blanche	4	3	883	1	0
West Gueydan	4	2	269	2	0
West Lake Verret	4	4	959	0	0
West Mermentau	1	1	120	0	0
White Castle	6	6	2,442	0	0
White Lake (Schooner Bayou)	1	1	220	0	0
Woodlawn	12	11	2,619	1	0
West Bay	1	1	732	0	0
Miscellaneous	66	0	0	66	0
Total	989	741	227,774	236	12

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	76	64	20,144	12	0
February	64	52	18,354	12	0
March	92	73	25,052	18	1
April	97	74	24,313	21	2
May	92	72	21,040	19	1
June	87	62	18,100	24	1
July	107	83	24,245	22	2
August	79	64	18,020	15	0
September	69	44	14,205	22	3
October	85	63	17,721	22	0
November	83	55	15,825	27	1
December	58	35	10,755	22	1
Total 1940	989	741	227,774	236	12
Total 1939	835	592	184,496	242	11
Difference	154	149	43,278	6	1



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GENERAL OFFICES: DALLAS, TEXAS

FRIO-VICKSBURG AND WILCOX TRENDS YIELD IMPORTANT RESULTS

By F. L. SINGLETON

THE opening of Tertiary production along the old shallow Jackson shore-line trend was the most significant feature of development in the Southwest Texas district during 1940. While only two fields were opened several deep tests drilled along the trend logged promising showings and there is little doubt that this type of development will continue in the limelight.

There were 28 fields opened which is slightly less than the number discovered during the preceding year. Sixteen of the fields were located in the Corpus Christi area, 10 in the Laredo district and 2 in the Balcones fault-line district. In addition important crude production was opened on several gas-distillate structures, while important extensions and numerous new sands were opened in many fields throughout the district.

Wilcox Production

The search for Wilcox production in Southwest Texas began the latter part of 1939, and ended in April 1940 with the opening of distillate production in the Thomaston area, De Witt County. The discovery well, Atlantic 1 Conwell, topped the Wilcox at 7,778 ft., and was completed through perforated casing at 7,855-85 ft. The company's 1 W. E. Conwell, 1 mile northeast of the discovery, was drilled to a total depth of 9,950 ft., and was completed for a small producer in a new sand at approximately 7,800 ft. The Wilcox was topped in this well at 7,735 ft.

Additional light was thrown upon the trend with the discovery of the Washburn field, 7 miles southwest of Fowlerton in La Salle County. The discovery well, H. R. Cullen, topped the Wilcox at 3,612 ft., and after drilling to a total depth of 8,300 ft., the well was plugged back and completed through perforated casing at 4,860-67 ft. However, production from this sand was short-lived due to salt-water encroachment, and the well was recently killed and is being completed as a gas well in sand at 4,754-59 ft. The operator controls a block of several thousand acres in the area, and is engaged in drilling a third test, the second well, 4,500 ft. northeast of the discovery having been abandoned at a depth of 5,500 ft.

Edwin M. Jones 1-B George West, a wildcat drilled 2½ miles southwest of the town of George West, Live Oak County, showed promise of opening production from the Wilcox, when it blew out from a total depth of 8,387 ft. The drill stem was cemented in the hole at 8,367 ft., and the well flowed for several days at the rate of 70 bbl. of 47-gravity oil and 1,300,000 cu. ft. of gas daily through a ⅛-in. choke. The well started to show salt water, and after several attempts to complete the well in upper sands failed, the hole was abandoned. This block was assembled on the strength of geophysical information, and the operator recently staked location for another deep-sand test.

The presence of Wilcox sand this far downdip has greatly enlarged the potentiality of this area, and the showings of the above-mentioned wells have resulted in a large-scale geophysical program, and several hundred thousand acres have been taken under lease.

SAN ANTONIO DISTRICT
Field Developments in 1940

County and field—	No. wells Jan. 1	No. wells Dec. 31	County and field—	No. wells Jan. 1	No. wells Dec. 31
Bastrop:			Frio:		
Hilbig	12	12	Pearsall	18	27
Bexar:			Guadalupe:		
Somerset	913	913	Darst Creek	336	357
Caldwell:			Burleson:		
Branyon	158	159	Tanglewood	1	1
Dale	52	54	Milam:		
Luling	582	587	Minerva-Rochdale	390	397
Lytton Springs	152	152			
Salt Flat	271	291	Total	3,594	3,701

Miscellaneous Fields

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Bastrop County:				
Carroll	6,232	16	7	7
Cedar Creek	14,957	41	9	10
Red Rock	150	1	2	2
Riddle	16,526	45	2	5
Yost	9,170	25	5	5
Bexar County:				
Alta Vista	4,486	12	33	33
Eckert	32,928	90	118	118
Gas Ridge	3,370	9	15	21
La Coste	1,194	3	4	1
Southton	17,820	49	102	102
Von Ormy	36,271	99	107	107
Caldwell County:				
Tinney Creek	3,210	22	0	1
North Dale	30,377	90	9	10
Walnut Creek	1,573	4	2	1
Larremore	18,197	50	10	12
Dunlap	37,941	104	11	11
Burdette Wells	4,596	13	2	4
Buchanan	39,049	107	33	34
Guadalupe County:				
Bee Creek	35,471	145	14	14
Spiller	3,221	9	3	3
Darst Creek Ext.	31,304	86	9	9
Zoboroski	19,486	53	11	14
Staples	243	1	0	1
Nash Creek	1,093	3	1	1
Elm Creek	9,014	25	19	19
Day	3,501	10	2	2
Medina County:				
Ina	5,192	14	5	5
Dunlay	31	1	1	1
Chacon Lake	12,479	34	50	65
Travis County:				
Manda	1,379	4	1	2
Kimbro	1,183	3	4	4
Williamson County—				
Beyersville	27,958	76	35	37
Chapman	65,611	179	69	70
Thrall	26,071	71	14	20

Stratton and Agua Dulce

Probably the most important development in the Corpus Christi area was the opening of important crude production on the Stratton and Agua Dulce gas-distillate structures in Nueces County. The discovery at Stratton was made by the Southern Minerals Corp., which has opened an active drilling program on the east flank of this structure. Several new sands have since been opened and development will be extended over a period of several months.

The discovery at Agua Dulce was made by Richardson Petroleum Corp. 2 McCoy, completed through perforated casing at 6,814-20 ft., for an initial production of 190 bbl. daily through a ½-in. choke. The completion of this well has created a trend play extending northeast from the Stratton field to the northeast side of the Agua Dulce field. One wildcat recently completed by F. A. Gillespie on the Dabney lease opened a new gas-distillate area 2 miles east of the Agua Dulce field from sand at 7,205-20 ft.

Offshore Operations

Another important phase of operations has been the development of submerged leases offshore from Aransas, Nueces and Kleberg counties which opened three new pools and added important extensions to the East White Point field. Humble Oil & Refining Co. opened the East Flour Bluff field with the completion of 1 State in Laguna Madre Bay offshore from Nueces County. The well was completed in the Frio sand at 6,790-6,800 ft. Approximately 10 wells had been completed at the close of the year and the structure appears to be one of major importance. A shallow dry-gas field was opened in Nueces Bay by the same company in Tract 723, while in Baffin Bay, offshore from Kleberg County, Skelly Oil Co. opened the Baffin Bay field with the completion of 1-385 State, and is now engaged in drilling a second well southwest of the discovery in Tract 388.

Frio-Vicksburg Trend

Development along the Frio-Vicksburg trend continued to add new reserves. The majority of the activity centered in Jim Wells County resulting in

SOUTHWEST TEXAS DISCOVERIES IN 1940

Pool, county, company, and farm name—	Survey	Date of comp.	Producing formation	Producing depth	Initial production	No. prod. wells Jan. 1, '41
Baffin Bay, Kleberg, Skelly Oil Co., 1-385 State	Laguna de Los Olmos	7-7	Frio	7,459-61	112 bbl., 23 hr., ¼-in. ck.	1
Bloomington, Victoria, Texas Gulf Prod. Co., 1 Kester	C. M. Creanor	6-1	Frio	5,103-5	15 bbl. dist., ⅛-in. ck.	1
Boyle, Starr, George Boyle, 1 E. B. Carruth	S. Lopez, Por. 92	6-2	Pettus	3,491-98	91 bbl., 8 hr., 7/64-in. ck.	6
Bridwell, Duval, Bridwell Oil Co., 1-A Rogers	J. Poitevent 21	7-12	Pettus	4,323-26	122 bbl., 1/16-in. ck.	4
Day, Guadalupe, A. J. Hollifield, 1 D. M. Day	J. Hinds	2-23	Chalk	2,360-2,837	8 bbl. hr., pumping	2
Duck Bay, Calhoun, Coronado Corp., 1 K. L. Welder	E. Hidalgo	7-27	Frio	5,654-55½ 5,658-59	200 bbl. fluid, 50% wtr., 1/2-in. ck.	2
East Flour Bluff, Nueces, Humble O. & R. Co., 1-30 State	Laguna Madre	5-20	Frio	6,790-6,800	177 bbl. daily, ⅛-in. ck.	10
Edwards, Victoria, Titanic Oil Co., 3 Edwards	D. Nira	10-18	Frio	5,030-34	Gas-dist.	3
Fagan, Refugio, C. L. Norsworthy, 1 B. J. Fox	J. Fagan	2-23	Frio	5,895-98	91 bbl. daily, 7/64-in. ck.	2
Gallagher, Jim Wells, M. M. Miller, 1 Gallagher	Casa Blanca	6-14	Frio-Vicksburg	5,187-5,207	110 bbl. daily, ⅛-in. ck.	3
Glen, Webb, Interstate Minerals, 46 Lopez	J. J. T. Wright	5-2	Mirando	2,173-85	1,440 bbl. daily, ½-in. ck.	41
Henshaw, Jim Wells, Henshaw Bros., 1 Grossman	Casa Blanca	10-15	Frio-Vicksburg	5,139-44	212 bbl. daily, 1/16-in. ck.	2
Holbein, Jim Hogg, Guy Davis, 1 Marrs McLean	Las Animas Gt. 3	9-30	Pettus	2,795-2,810	30 bbl., jetting	1
Manila, Jim Hogg, Achning-Daubert, 1 Wood	Sabas de la Garza 82	6-14	Pettus	2,607-13	53 bbl., 1/2-in. ck.	13
North Keeran, Victoria, Barnsdall Oil Co., 1-A Keeran	Martin De Leon	1-19	Frio	5,550-52	33 bbl., ⅜-in. ck.	1
North Rincon, Starr, Sun Oil Co., 1 Lehr	C.C.S.D.&R.G.N.G. 513	6-7	Frio-Vicksburg	4,100-54	15 bbl., 1/2-in. ck.	1
Nueces Bay, Nueces, Humble O. & R. Co., 1-723 State	No. 723	7-19	Catahoula	3,974-90	Gas well	1
St. Charles, Aransas, Continental Oil Co., 2 St. Charles Co.	R. D. Blassman	7-29	Frio	7,604-10	48 bbl. dist., ¼-in. ck.	1
Shield, Nueces, Fred W. Shield, 1 Moore	Delores I.&A. 143	8-7	Frio	6,622-26	129 bbl., ⅛-in. ck.	3
Terrell, Victoria, Colton & Colton, 1 Terrell	J. Sideck	5-24	Vicksburg	5,274-84	35 bbl., pumping	1
Thomaston, De Witt, Atlantic Ref. Co., 1 Conwell	C. Lockhart	4-5	Wilcox	7,855-85	140 bbl., ¼-in. ck.	2
Washburn, La Salle, H. R. Cullen, 1 Washburn	H.&G.N.R.R. 67	8-9	Wilcox	4,860-67	113 bbl. fluid, 13% S.W., ⅝-in. ck.	1
Weygand (Tinney Creek), Caldwell, Weygand Bros., 1 W. C. Hill	J. D. Rains	8-16	Chalk	2,347-70	208 bbl., ¼-in. ck.	2
Yzaguirre, Starr, Complete Oil Well Service Co., 1 Yzaguirre	G.B.&C.N.G. 227	8-23	Frio	4,896-4,904	31 bbl. 12 hr., 1/16-in. ck.	1
Willamar, Willacy, Pan American, 1 Garcia	San Juan de Carr, Gt.	11-18	Frio	7,620-78	263 bbl., ¼-in. ck.	1
Orange Grove, Jim Wells, Henshaw Bros., 1 Blaschke	Casa Blanca Gt.	5-17	Frio-Vicksburg	5,100-3	87 bbl., ½-in. ck.	19
Nichols, Hidalgo, Royal Oil & Gas Co., 1-A Yturria Town & Imp. Co.	A. Villarel 43	10-27	Frio	3,497-3,503	52 bbl., ½-in. ck.	2
Kreis, Duval, I. K. Howeth, 1 Kreis	L. Gunter 68	10-25	.....	3,249-58	38 bbl., pumping	1

the discovery of the Orange Grove, Gallagher and Henshaw fields while the Wade City distillate field received its first crude-oil production. With the exception of the Henshaw field which is still in the early stages of development, these discoveries received an extensive drilling program which has extended production over several acres and they are marked as important reserves.

The possibilities of the Frio-Vicksburg trend were further enhanced by two discoveries in Starr County located on the extreme southwest part of the trend which was placed in the limelight in 1939 with such discoveries as Kelsey, Sun and the North Rincon fields. The new strikes included the Yzaguirre, about 2 miles northeast of the Rincon field, and the North Rincon field which was opened by the completion of Sun 1 Lehr. Both are in the early stages of development although recent developments indicate an expansion of drilling activity as important extensions and new sand discoveries have been recorded.

New sand discoveries and important extensions marked the Rincon field, Starr County, as one of the most important discoveries to be found along the trend. Multiple sands producing gas, distillate and oil were opened at intervals from approximately 3,600 to 5,400 ft., and the structure is still undefined in many directions. W. R. Davis Co., Inc., which has been the only operator in the field, recently sold a half interest in its holdings to Continental Oil Co. for a reported consideration of $6,000,000 and development of the field has been taken over by the latter company.

Other gas or distillate fields in the Corpus Christi

SOUTHWEST TEXAS—LAREDO DISTRICT—CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
BROOKS COUNTY—														
Alta Mesa	259,557	709	11,873	11,797	27,647	32,452	28,675	23,160	20,644	17,961	22,956	26,321	18,990	17,081
Kelsey	635,190	1,735	55,056	56,968	65,098	64,144	59,582	51,330	48,119	46,487	45,347	48,373	47,070	47,616
Total	894,747	2,444	66,929	68,765	92,745	96,596	88,257	74,490	68,763	64,448	68,303	74,694	66,060	64,697
DUVAL COUNTY—														
Casa Blanca	131,261	356	9,021	9,686	9,202	8,880	8,587	7,920	8,590	8,246	16,680	17,100	13,740	13,609
Cedro Hill	192,895	527	8,494	7,540	11,124	11,190	13,454	13,500	13,759	12,245	25,950	27,344	25,262	23,033
Charamousca	136,053	372	13,330	12,267	13,237	12,150	12,369	10,200	11,408	11,646	10,140	11,380	9,060	8,866
Driscoll	856,443	2,340	4,247	28,157	150,212	58,185	78,988	83,100	76,930	73,751	75,339	84,924	73,232	69,378
Fitzsimmons	734,246	2,006	84,413	79,251	79,786	75,662	67,580	53,820	47,119	43,860	59,275	59,756	43,920	39,804
Government Wells	3,495,287	9,550	330,863	317,764	338,442	323,824	308,946	262,710	246,942	264,392	321,733	295,065	233,010	251,596
Hoffman	1,885,420	5,151	119,474	114,748	187,296	176,228	178,862	147,660	130,476	152,318	190,615	193,225	142,744	151,776
Labbe	66,375	181	3,441	6,783	5,451	4,770	5,084	4,830	4,185	4,030	8,010	7,285	6,244	6,262
Loma Novia	2,934,290	8,017	270,847	274,566	278,090	259,655	272,211	234,810	206,376	191,982	234,136	271,042	224,810	215,765
North Sweden	1,939,171	5,298	194,463	183,466	232,539	216,046	194,339	162,780	144,525	132,036	121,372	134,018	102,780	120,807
Piedre de Lumbre	728,607	1,991	57,623	55,045	57,373	53,564	40,424	53,970	62,042	69,071	94,120	72,740	53,828	58,807
Rancho Solo	131,247	359	14,601	12,192	10,675	10,529	13,454	11,010	9,863	8,906	8,659	11,781	10,184	9,393
Sarnosa	154,010	421	10,912	10,966	12,095	11,962	11,315	12,750	13,075	12,158	16,087	16,528	13,018	13,144
Seven Sisters	2,424,068	6,623	158,596	144,023	231,249	215,373	228,687	188,190	170,097	189,535	232,332	238,312	196,445	231,229
Sweden	680,690	1,860	61,690	44,512	81,007	66,546	59,861	66,210	50,716	47,153	44,498	58,627	54,338	45,532
Tarancahuas	117,157	320	651	2,767	6,207	6,980	7,068	7,020	11,714	11,542	17,691	18,051	13,020	14,446
Miscellaneous	217,161	.....	17,453	17,296	20,177	19,171	21,799	17,700	15,998	14,717	16,157	18,662	19,110	18,921
Total	16,824,381	45,968	1,360,119	1,321,029	1,724,160	1,530,715	1,523,028	1,338,180	1,223,815	1,247,588	1,492,794	1,535,840	1,234,745	1,292,368
JIM HOGG COUNTY—														
Colorado	784,741	2,144	36,115	27,542	61,314	25,784	65,534	65,790	66,550	69,721	75,387	86,036	87,512	67,456
Manila	43,168	234	.....	.....	.....	.....	.....	1,170	2,249	5,835	6,283	9,688	11,464	6,479
Randado	91,510	250	7,037	9,113	4,513	10,362	7,347	11,010	8,037	7,824	7,609	7,285	5,793	5,580
Miscellaneous	15,181	.....	930	880	837	997	1,116	1,020	889	1,044	1,345	1,985	2,108	2,030
Total	934,600	2,554	44,082	37,535	66,664	87,143	73,997	78,990	77,725	84,424	90,624	104,994	106,877	81,545
McMULLEN COUNTY—														
Ezzell	438,130	1,197	58,621	39,443	41,018	38,759	39,866	32,910	29,845	29,291	39,912	36,317	30,510	21,638
Jacobs	118,699	324	10,106	12,192	10,675	10,529	11,532	10,740	9,731	8,920	9,394	10,503	7,526	6,851
Munson	44,391	121	5,580	4,172	3,897	4,073	4,433	3,600	2,904	3,317	3,401	3,168	3,118	2,728
Calliham	59,431	162	5,828	5,717	4,465	5,018	5,797	5,160	5,777	5,242	4,011	5,045	3,930	3,441
Total	660,651	1,805	80,135	61,524	60,055	58,379	61,628	52,410	48,257	46,770	56,718	55,033	45,084	34,658
STARR COUNTY—														
Cuevitas	158,689	434	10,013	7,871	17,303	17,062	15,779	12,810	11,098	9,757	13,799	18,525	11,280	13,392
Ricaby	137,452	376	12,865	8,739	10,776	10,863	11,811	9,930	10,326	9,943	15,345	14,897	10,890	11,067
Rincon	903,655	2,469	4,743	3,451	15,771	31,405	68,882	67,860	40,108	41,374	163,201	183,599	182,790	100,471
Sun	280,459	766	17,298	18,911	21,860	21,705	26,629	23,190	22,037	23,140	24,675	25,158	27,274	28,582
Samfordyce	536,617	1,466	56,265	49,374	47,781	44,565	47,616	42,360	41,733	37,659	38,725	42,779	40,020	47,740
Miscellaneous	89,863	.....	3,726	5,261	4,132	3,978	5,053	6,060	9,978	7,417	7,843	12,595	10,614	13,206
Total	2,106,735	5,756	104,910	93,607	117,623	129,578	175,770	162,210	135,280	129,290	263,588	297,553	282,868	214,458
WEBB COUNTY—														
Adami	236,358	646	9,486	18,171	21,226	23,039	26,288	21,450	19,249	17,636	20,436	23,026	19,860	16,491
Aviator	100,634	276	8,618	9,736	8,659	9,220	9,672	8,280	8,255	8,575	8,868	8,329	6,180	6,242
Bruni	108,020	295	8,711	15,631	16,585	15,480	10,757	8,610	7,412	4,217	3,650	3,452	8,100	5,115
Cole	1,705,992	4,661	218,705	148,351	159,487	146,043	146,134	135,600	110,319	101,242	151,651	147,070	130,200	111,190
Killam	121,833	333	13,671	13,469	12,423	10,980	9,331	9,600	9,787	8,830	9,851	8,758	9,243	5,890
Lopez	1,645,584	4,496	115,172	117,085	157,207	150,882	167,090	139,110	126,320	131,849	148,130	147,386	122,934	122,419
Glen	109,276	299	.....	.....	.....	.....	775	2,820	5,132	8,978	19,044	23,096	21,841	27,590
Moca	78,908	216	5,425	5,741	4,397	4,114	6,101	8,100	7,114	6,658	8,592	7,567	8,248	6,851
Oilton	232,181	634	20,925	20,572	22,636	21,529	22,475	20,790	19,669	18,879	18,300	17,532	15,389	13,485
Volpe	151,712	415	8,246	9,106	11,191	12,990	12,988	11,580	11,842	10,726	17,250	17,861	13,020	14,911
Miscellaneous	29,517	.....	2,387	2,411	2,338	1,766	4,123	4,710	2,049	2,282	1,661	1,700	2,075	2,015
Total	4,520,015	12,349	411,346	360,273	416,149	396,043	415,735	370,650	327,148	319,872	407,433	406,077	357,090	332,199
ZAPATA COUNTY—														
Comitas	229,770	628	19,871	18,975	21,001	23,012	22,754	21,900	20,121	18,311	16,425	17,499	17,253	12,648
Escobas-Cuellar	832,322	2,274	71,114	66,053	76,054	82,746	73,904	70,890	63,167	62,054	72,540	86,753	53,913	53,134
Mirando Valley	347,806	950	28,892	27,184	33,981	34,635	32,023	35,400	23,952	28,594	39,739	19,439	27,570	16,397
Charco Redondo	4,894	13	.....	274	.....	58	465	690	1,105	648	24	415	750	465
Total	1,414,792	3,866	119,877	112,486	131,036	140,451	129,146	128,880	108,345	109,607	128,728	124,106	99,486	82,644
Total	27,355,921	74,742	2,187,398	2,055,219	2,608,432	2,438,905	2,467,561	2,205,810	1,989,333	2,001,999	2,508,188	2,598,297	2,192,210	2,102,569
Daily average	74,742	.....	70,561	70,869	84,142	81,297	79,598	73,527	64,172	64,580	83,606	83,816	73,074	67,824

SOUTH CENTRAL TEXAS—SAN ANTONIO DISTRICT—CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
BASTROP COUNTY—														
Hilbig	68,532	187	8,370	7,001	7,514	6,962	6,851	5,640	4,958	4,562	4,349	4,470	4,228	3,627
Miscellaneous	47,047	.....	4,208	4,043	4,453	4,433	5,115	4,620	2,501	3,795	3,646	2,937	3,320	3,976
Total	115,579	316	12,578	11,044	11,967	11,395	11,966	10,260	7,459	8,357	7,995	7,407	7,548	7,603
BEXAR COUNTY—														
Somerset	192,810	527	16,647	20,387	15,841	15,390	17,143	16,440	17,546	17,670	15,540	16,860	12,930	10,416
Miscellaneous	95,272	.....	9,362	8,648	8,900	7,952	8,866	7,170	8,102	8,155	7,675	7,746	6,590	6,106
Total	288,082	787	26,009	29,035	24,741	23,342	26,009	23,610	25,648	25,825	23,215	24,606	19,520	16,522
CALDWELL COUNTY—														
Branyon	372,410	1,018	34,100	31,320	33,046	32,340	33,635	31,410	28,768	27,900	26,160	28,310	32,706	32,715
Dale	73,641	201	7,161	7,859	7,471	6,150	6,369	6,100	6,417	5,890	5,250	5,840	4,856	4,278
Luling	2,387,148	6,522	203,763	190,414	207,545	193,380	185,411	178,980	202,957	202,895	189,690	214,258	205,350	212,505
Lytton Springs	102,731	281	7,843	9,243	9,135	8,530	8,990	9,360	9,158	9,509	8,558	9,281	7,110	6,014
Salt Flat	1,564,248	4,274	116,033	131,868	140,981	134,752	145,018	138,900	118,824	135,794	129,057	126,882	115,412	130,727
Miscellaneous	117,018	.....	9,021	10,954	10,211	8,241	12,400	11,340	9,159	10,156	8,517	8,871	9,561	8,587
Total	4,617,196	12,616	377,921	381,658	408,389	383,393	391,823	376,090	375,283	392,144	367,232	393,442	374,995	394,826
FRIO COUNTY—														
Pearsall	249,611	682	13,020	12,781	19,473	23,056	33,325	28,470	16,295	17,886	16,508	20,466	25,540	22,791
GUADALUPE COUNTY—														
Darst Creek	2,128,900	5,817	205,840	198,590	212,147	200,561	206,832	191,400	168,090	154,892	147,698	153,210	149,458	140,182
Miscellaneous	98,343	.....	2,759	7,547	8,830	9,304	7,156	6,330	9,353	8,437	9,547	10,204	9,863	9,013
Total	2,227,243	6,085	208,599	206,137	220,977	209,865	213,988	197,730	177,443	163,329	157,245	163,414	159,321	149,195
BURLESON COUNTY—														
Tanglewood	6,687	18	248	144	956	646	1,023	960	180	739	361	.....	810	620
MEDINA COUNTY—														
Miscellaneous	17,249	47	1,178	1,107	1,223	1,407	1,736	1,980	1,710	1,667	1,425	1,563	1,106	1,147
MILAM COUNTY—														
Minerva-Rockdale	73,476	201	3,689	6,849	6,661	6,867	6,975	6,600	5,911	7,002	5,787	7,242	5,398	4,495
TRAVIS COUNTY—														
Miscellaneous	2,560	7	279	220	228	229	186	180	284	208	140	179	212	215
WILLIAMSON COUNTY—														
Miscellaneous	119,520	327	9,269	10,272	12,780	9,752	10,757	10,320	9,083	10,886	11,034	10,716	8,033	6,718
Total	7,717,203	21,085	653,790	659,247	707,395	669,952	697,788	656,200	619,296	628,043	590,942	629,035	602,483	604,132

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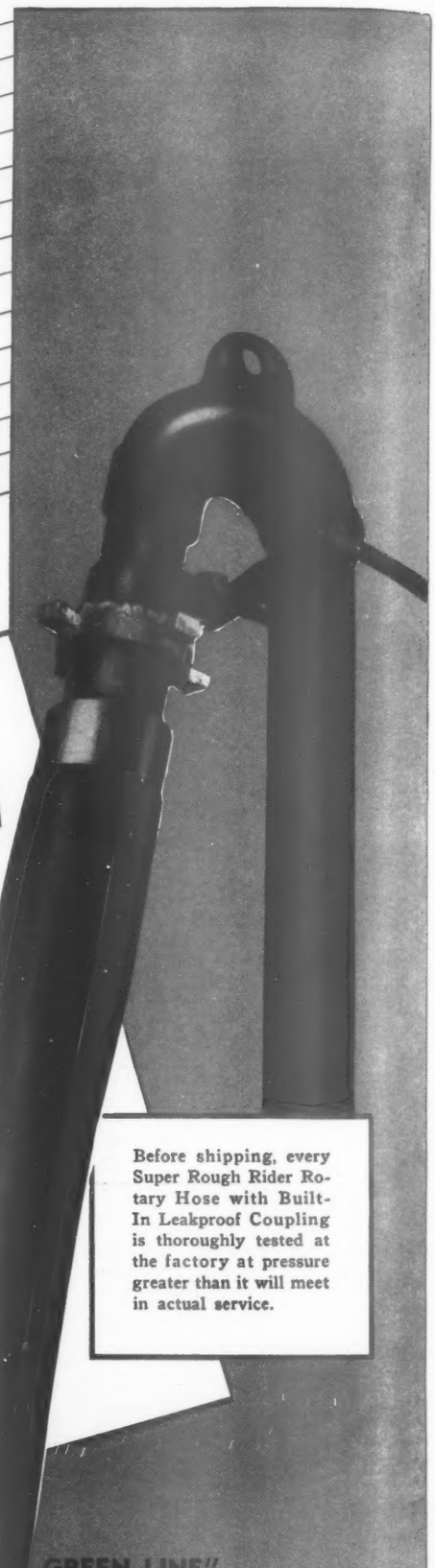

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area receiving their first crude production included the Telferner and Victoria fields, Victoria County; East Mathis, San Patricio County; Robstown, Nueces County, and the Weser field in Goliad County.

South of the Telferner gas field, Sunray Oil Co. and Colton opened production from the basal Oakville sand at 2,696-2,700 ft. with the completion of 1 Mahon. However, additional development proved disappointing and work has been temporarily halted.

East Mathis and Robstown

The East Mathis field, San Patricio County, received its first crude production with the completion in a new sand at 5,614-18 ft. for an initial production of 140 bbl. per day flowing through a ¼-in. choke. The sand was logged approximately 400 ft. deeper than the discovery well which was completed as a distillate well in a 5,200-ft. sand.

The anticipated large-scale drilling program in the Robstown field, Nueces County, which was expected to follow the completion of Richardson Petroleum Co. 1 Studer failed to materialize due to erratic sand conditions. Located 1 mile south of the discovery well, a gas-distillate producer, 1 Studer was completed in a new sand at 5,195-2,207½ ft. for an initial production of 225 bbl. of oil per day through ¼-in. choke. Permits for several wells within the townsite of Robstown were granted but these were not drilled in view of several abandonments.

Victoria County

One of the most active counties in the lower Gulf Coast district was Victoria County which received several new fields, important extensions and new sand discoveries in proven fields. The new fields included North Keeran, North McFaddin, Terrell, Edwards and Bloomington, while new sands and extensions were opened at McFaddin and Keeran. With most of the fields in the early stages of development and the existence of several known producing sands extending from the Oakville to the Vicksburg formations, wildcatting in this county has been placed in a favorable light and no letup in exploration is anticipated.

Willacy County

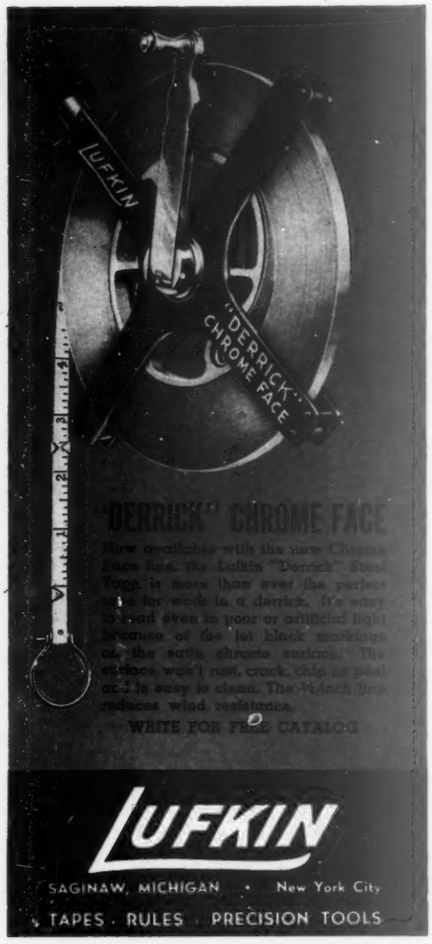
The discovery of the first production in Willacy County placed the Rio Grande Valley district in a position to receive its long-awaited exploitation campaign. The discovery well which was drilled by Pan American Production Co. on a farmout block from Shell Oil Co., Inc., is located in the Willamar community, and production is from approximately 39 ft. of Frio sand. The structure was found by geophysical methods, and it is reported to be one of the largest ever found in the lower Gulf Coast district. Willacy County, like most of the adjoining counties, including Cameron and Kenedy, is located in practically virgin territory, and most of the acreage has been under lease for several years, as the result of a large-scale geophysical program which is said to have uncovered several promising structures. With the approach of expiration dates on most of these blocks, several interesting deep tests can be expected to be drilled in the near future.

Laredo District

Several important strikes were marked up for the Laredo district resulting in increased wildcatting activity. Probably the most important was the Glen field, Webb County, which was opened by Interstate Minerals, Inc., 2 miles north of the Mirando field.

LOWER TEXAS GULF COAST—CORPUS CHRISTI DISTRICT

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
ARANSAS COUNTY—														
McCampbell	3,047,988	8,327	311,674	260,569	348,742	322,732	301,816	253,350	234,651	215,536	197,623	199,295	208,591	193,409
BEE COUNTY—														
Dirks	516,238	1,410	39,680	50,780	52,826	51,473	49,073	39,000	36,080	33,003	42,382	51,204	37,412	33,325
North Pettus	281,883	770	22,962	29,906	28,304	27,907	30,132	21,160	23,384	21,871	20,863	20,962	17,940	16,492
Pettus	132,962	363	10,633	13,421	13,116	13,731	14,074	12,420	10,270	9,341	8,840	9,247	9,034	8,835
Miscellaneous	226,554	.....	20,733	20,849	20,639	20,887	20,553	17,940	18,435	16,915	18,960	17,116	17,004	16,523
Total	1,157,637	3,163	94,008	114,956	114,885	113,998	113,832	90,520	88,169	81,130	91,045	98,529	81,390	75,175
CALHOUN COUNTY—														
Heyser	3,371,215	9,212	303,955	224,089	348,075	331,304	315,673	334,500	291,597	269,924	256,303	271,484	265,560	158,751
Miscellaneous	8,087	.....	31	.....	.....	.....	31	30	735	1,905	1,194	.....	1,650	2,511
Total	3,379,302	9,233	303,986	224,089	348,075	331,304	315,704	334,530	292,332	271,829	257,497	271,484	267,210	161,262
DE WITT COUNTY—														
Thomaston	3,133	9	.....	.....	.....	.....	.....	.....	403	379	1,156	328	154	713
GOLIAD COUNTY—														
Miscellaneous	12,269	34	1,054	995	718	1,226	1,085	960	710	1,550	841	790	728	1,612
HIDALGO COUNTY—														
La Bianca	128,077	349	12,958	10,618	10,537	12,576	9,920	9,570	10,911	13,082	12,427	8,277	8,000	9,201
Miscellaneous	51,951	.....	5,394	5,262	5,086	4,877	3,565	3,450	4,718	5,226	4,529	3,457	3,050	3,337
Total	180,028	492	18,352	15,880	15,623	17,453	13,485	13,020	15,629	18,308	16,956	11,734	11,050	12,538
KARNES COUNTY—														
South Burnell	181,388	496	18,104	17,633	17,796	15,612	16,182	15,450	14,253	12,947	14,162	13,523	13,140	12,586
KLEBERG COUNTY—														
Miscellaneous	30,567	84	2,945	1,870	1,408	1,365	1,674	1,200	4,527	3,980	4,031	3,183	2,462	1,922
JIM WELLS COUNTY—														
Alfred	113,217	8,153	8,153	4,249	4,612	5,622	6,918	12,150	10,390	12,761	10,314	13,607	11,762	12,679
East Premont	126,381	13,671	13,671	12,788	13,882	13,498	11,377	10,770	9,119	9,809	8,305	8,694	7,803	6,665
Ben Bolt	739,252	42,501	42,501	34,885	77,705	90,451	86,335	67,590	61,013	56,840	57,304	55,320	52,020	57,288
Magnolia City	92,328	8,494	8,494	6,189	10,649	13,757	6,913	8,670	6,541	6,083	6,400	6,189	7,080	5,363
Premont	137,926	8,587	8,587	10,366	14,325	13,942	11,439	13,680	11,730	10,120	10,028	10,669	11,012	12,028
Reynolds	476,643	43,431	43,431	35,608	62,128	52,177	40,083	60,300	35,586	32,811	34,799	36,000	22,020	21,700
South Alice	1,092,968	100,502	100,502	94,506	168,660	149,674	104,284	88,500	74,537	65,071	68,401	60,587	59,160	59,086
Orange Grove	191,636	.....	.....	.....	.....	.....	682	5,460	11,852	20,878	33,030	38,471	40,622	40,641
Wade City	648,370	496	496	435	496	204	24,459	42,000	63,453	79,319	97,954	116,257	103,110	120,187
Gallagher	26,173	.....	.....	.....	.....	.....	.....	.....	1,726	3,912	5,679	5,100	4,920	4,836
Miscellaneous	22,811	2,232	2,232	2,533	1,165	2,025	1,953	1,860	1,336	755	1,301	2,268	2,190	3,193
Total	3,667,705	228,067	228,067	201,559	353,622	341,350	294,443	310,980	287,283	298,359	333,515	353,162	321,699	343,666
LIVE OAK COUNTY—														
Oakville	216,160	591	13,733	19,183	16,010	14,704	13,950	19,800	14,228	17,899	20,896	23,760	20,762	21,235
White Creek	92,193	252	5,084	5,111	6,679	4,935	5,363	8,910	9,797	8,947	10,010	11,944	5,852	9,561
Miscellaneous	45,138	.....	2,945	3,849	3,791	4,569	3,999	3,810	3,077	3,930	3,248	3,742	3,869	4,309
Total	353,491	966	21,762	28,143	26,480	24,208	23,312	32,520	27,102	30,776	34,154	39,446	30,483	35,105
NUECES COUNTY—														
Agua Dulce	99,191	271	17,081	9,276	11,638	8,538	6,364	6,921	8,308	7,631	7,850	4,865	4,140	6,579
Bentonville	400,996	1,096	33,852	35,912	40,634	36,319	32,550	49,850	32,089	26,962	27,299	28,229	24,723	33,077
Clara Driscoll and S.	981,029	2,680	89,050	77,228	85,932	81,787	78,127	58,980	89,781	89,967	105,160	79,983	79,500	65,534
East Flour Bluff	42,809	117	.....	.....	.....	.....	.....	1,170	1,272	1,212	3,964	5,703	19,320	10,168
Flour Bluff	1,107,807	3,026	129,053	122,342	128,053	117,867	107,663	84,960	74,465	70,426	65,678	68,148	65,310	73,842
Luby	1,428,789	3,904	198,121	156,867	166,394	156,670	137,330	114,480	97,560	60,391	88,971	91,529	87,750	72,726
Minnie Bock	379,104	1,036	30,411	24,487	42,823	30,364	31,620	28,530	24,180	24,981	30,570	38,418	35,458	37,262
Saxet	5,252,615	14,351	514,291	495,586	531,048	507,956	488,436	517,800	402,017	368,163	410,279	385,440	315,120	316,479
Saxet Heights	223,834	611	21,018	21,747	27,376	18,133	25,296	24,000	15,458	12,662	12,893	14,499	16,533	14,219
Stratton	74,744	205	5,208	5,539	6,200	6,960	7,657	8,700	1,555	2,498	3,778	7,545	7,200	11,904
South Saxet	81,723	223	8,649	8,046	9,268	8,401	7,595	6,180	6,038	5,401	6,532	6,734	4,260	4,619
West Saxet	933,400	2,550	88,846	75,495	66,761	75,405	77,748	87,300	84,965	83,710	78,926	79,781	65,860	68,603
Miscellaneous	133,266	.....	11,563	9,956	10,046	9,383	9,735	10,440	10,846	11,506	11,677	14,936	10,902	12,276
Total	11,139,307	30,435	1,147,143	1,042,481	1,126,173	1,057,783	1,010,121	998,811	848,534	765,510	853,577	825,810	736,076	727,288
REFUGIO COUNTY—														
Greta	1,475,139	4,030	128,464	123,996	131,530	123,479	112,034	103,650	113,461	105,097	119,733	123,885	121,263	168,547
La Rosa	1,280,877	3,500	144,708	108,888	154,712	155,916	143,499	104,790	99,996	75,353	73,790	73,239	69,540	76,446
Melon Creek	130,355	356	12,710	9,543	14,373	11,733	12,431	10,290	11,022	10,609	10,334	10,517	9,446	7,347
Refugio	1,824,757	4,986	183,148	176,368	185,081	183,299	149,730	125,700	137,877	142,827	160,495	153,034	112,498	114,700
Tomoconnor	5,820,819	14,428	351,819	568,164	611,899	577,004	517,576	591,390	466,433	429,183	411,803	429,662	405,753	460,133
Fox	134,642	368	14,415	14,104	14,629	13,523	13,299	11,100	7,885	9,458	8,002	8,375	8,940	10,912
Fagan	21,472	.....	.....	1,196	1,247	1,632	2,536	2,610	2,972	2,025	1,963	1,876	1,648	1,767
Total	10,688,061	29,202	835,264	1,002,259	1,113,471	1,066,586	951,105	949,530	839,646	774,552	786,120	800,588	729,088	839,852
SAN PATRICIO COUNTY—														
East White Point	2,974,477	8,127	295,895	244,955	374,501	271,327	252,278	229,110	227,512	209,417	205,080	211,626	227,250	225,526
Midway	346,184	946	21,204	18,730	19,484	30,064	27,838	24,750	23,952	28,954	39,739	43,900	36,662	30,907
Plymouth	2,739,651	7,485	356,221	214,953	379,154	263,893	238,235	255,780	197,630	180,709	174,606	182,495	173,850	122,125
Taft	926,068	2,530	136,121	60,379	102,660	84,122	72,540	63,000	54,382	50,458	92,142	82,503	70,380	57,381
Miscellaneous	26,895	.....	1,705	2,321	1,671	1,400	2,976	2,310	3,093	2,993	2,806	2,022	1,787	1,811
Total	7,013,275	19,162	811,146	541,338	877,470	650,806	593,867	574,950	506,569	472,531	514,373	522,546	509,929	437,750
VICTORIA COUNTY—														
Coletto Creek	110,248	301	7,781	11,167	10,834	9,878	10,013	9,450	8,343	7,402	8,422	9,123	9,000	8,835
East Placedo	141,948	388	11,625	10,383	11,257	11,370	16,430	16,920	15,946	11,292	8,344	9,149	9,746	9,486
Keeran	244,025	667	24,180	21,853	21,990	20,802	26,598	21,810	25,210	18,947	16,535	16,759	15,453	13,888
McFaddin	799,467	2,184	66,464	56,700	63,027	62,352	67,239	65,460	62,106	72,348	78,381	82,455	61,710	61,225
Placedo	1,729,419	4,725	161,603	152,941	156,312	149,930	152,551	144,000	129,372	141,450	157,326	156,869	118,410	108,655
Victoria	90,928	248	403	433	2,947	7,607	6,231	9,210	20,394	17,350	6,076	9,901	5,850	4,526
Miscellaneous	42,384	.....	2,759	987	2,032	1,562	1,271	2,280	4,296	6,136	4,754	5,051	5,078	6,178
Total	3,158,419	8,630	274,815	254,464	268,399	263,501	280,333	269,130	265,667	274,925	279,838	289,307	225,247	212,793
WILLACY COUNTY—														
Willamar	1,519	49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,519
Total	44,014,089	120,270	4,068,320	3,706,236	4,612,862	4,207,924	3,916,959	3,844,951	3,425,475	3,222,312	3,384,888	3,429,725	3,137,247	3,057,190
Daily average	120,270	.....	131,236	127,801	148,802	140,264	126,356	128,165	110,499	103,945	112,829	110,636	104,575	98,619



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The discovery resulted in an active drilling campaign and at the end of the year, production had been extended for a distance of approximately 2½ miles in a northeast-southwest direction. The field is still undefined to the south and now extends into Zapata County. Production is from the Mirando sand at approximately 2,150-85 ft.

In Starr County, and located about 5 miles southeast of the Barbacoas field, George R. Boyle et al opened an important Pettus sand strike with the completion of 1 Carruth which was completed in sand at 3,490-98 ft. A mile south extension was recently recorded, and an active drilling campaign is in progress. Across the county line in Jim Hogg County, Achning & Daubert opened the Malina field which is producing from the Pettus sand at 2,603-14 ft. While both fields are in the early stages of development, they are important fields, and development is expected to extend over a period of several months. The two pools are the first Pettus sand fields to be found in this part of South Texas which opens a new trend play for this type of production.

Balcones Fault-Line District

Of the two fields opened in the Balcones fault-line district, Tinney Creek in Caldwell County, is the most important although development has been limited to a few tests. The discovery well is located 1½ miles northeast of the Salt Flat field, and was completed in the Austin chalk at 2,347-70 ft. While development in this district during the past few years has failed to uncover any outstanding fields, wildcatting continues fairly active and the usual number of shallow tests in search for Edwards lime and chalk production is expected to continue.

There were 2,072 wells drilled during the year, of which 725 were dry and 70 were gas wells. This is a decrease of 352 wells from the preceding year. The drop is due to a decrease in activity in the East White Point and McCampbell fields in Nueces, Aransas and San Patricio counties which are practically drilled up.

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	199	125	15,478	66	8
February	182	115	14,003	63	4
March	193	115	12,241	71	7
April	187	108	12,666	75	4
May	220	144	19,437	71	5
June	183	115	16,042	59	9
July	148	98	13,850	45	5
August	191	105	16,297	78	7
September	144	85	10,273	55	6
October	177	112	12,156	57	6
November	145	90	10,039	49	6
December	102	64	7,672	37	3
Total 1940	2,071	1,275	160,154	726	70
Total 1939	2,424	1,592	204,591	745	87
Difference	353	317	44,437	19	17

SOUTH TEXAS
Field Developments in 1940

County and field—	No. wells Jan. 1	No. wells Dec. 31
Brooks:		
Alta Mesa	22	22
Kelsey	51	78
Duval:		
Casa Blanca	31	35
Cedro Hill	21	72
Charamousca	15	19
Driscoll	36	54
Fitzsimmons	77	79
Government Wells	686	666
Hoffman	298	328
Labbe	14	13
Loma Novia	722	716
North Sweden	257	256
Piedre de Lumbre	122	117
Rancho Solo	29	40
Sarnosa	41	41
Seven Sisters	401	448
Tarancahuas	1	5
Jim Hogg:		
Colorado	17	110
Manila	0	13
Randado	89	94
McMullen:		
Calliham	58	64
Ezzell	141	142
Jacobs	79	69
Munson	2	16
Starr:		
Cuevitas	14	11
Ricaby	18	24
Rincon	2	47
Sun	15	42
Samfordye	131	126
Webb:		
Adami	19	70
Aviator	75	65
Bruni	38	27
Cole	290	298
Glenn	0	41
Killam	74	59
Lopez	340	342
Moca	11	11
Oilton	188	175
Volpe	12	29
Zapata:		
Comitas	162	145
Escobas:		
Cuellar	392	409
Mirando Valley	75	95
Charco Redondo	52	47
Total	5,261	5,758
Total SW. Texas	12,448	13,462

Miscellaneous Fields

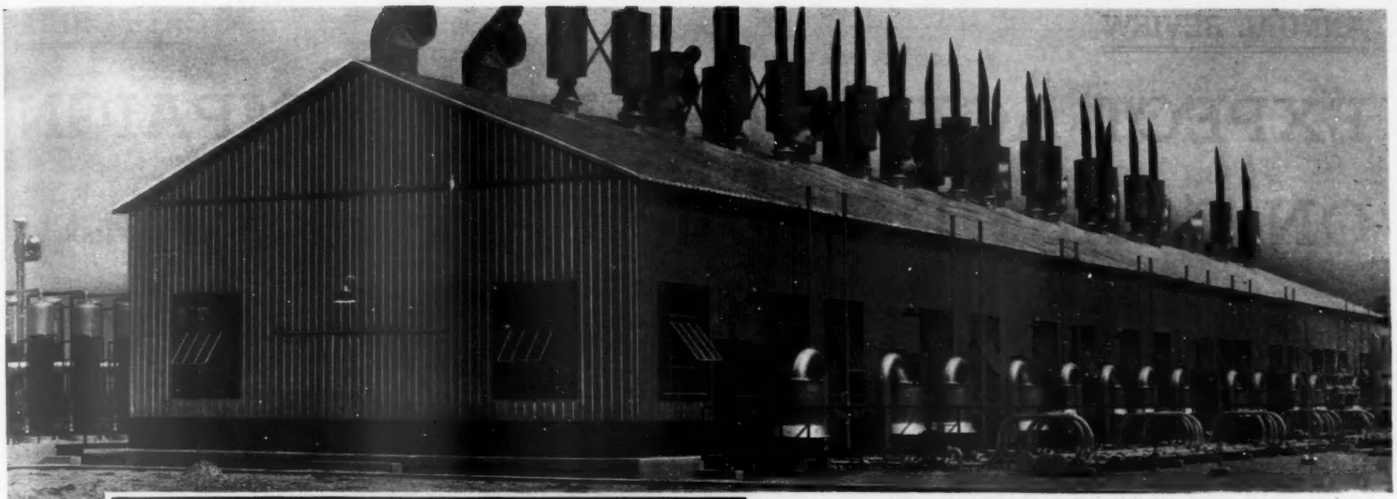
Duval County:	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Bridwell	12,394	78	0	4
Chiltipin	9,488	26	2	4
Colmena	65,523	179	25	26
Loma Alta	13,181	36	3	4
Loma Vista	3,749	10	1	1
North Kohler	4,783	13	1	3
Muralla	22,016	60	2	3
Peters	41,134	112	4	7
Piedras Pintas	31	1	2	6
Sejita	1,360	15	0	2
Tesoro	12,394	78	0	5
Jim Hogg County:				
Gutierrez	1,884	6	1	0
Henne-Winch-Farris	1,230	5	1	1
Holbein	2,591	28	0	1
Las Animas	9,485	26	3	2
Starr County:				
Barbacoas	1,699	5	2	2
Boyle	24,699	101	0	6
La Reforma	594	10	0	3
Los Olmos	25,559	70	71	68
Rio Grande City	21,962	60	15	10
Roma	2,243	40	0	2
North Rincon	7,434	40	0	3
Hayden	1,556	4	0	3
Nichols	1,801	29	0	1
Yzaguirre	2,314	25	0	1
Webb County:				
Albercas	16,011	44	17	16
Carolina-Texas	3,805	10	2	2
Laurel	4,848	13	6	5
North Killam	4,813	13	6	9

LOWER TEXAS GULF COAST
Field Developments in 1940

County and field—	No. wells Jan. 1	No. wells Dec. 31
Aransas:		
McCampbell	264	257
Bee:		
Dirks	93	92
North Pettus	16	60
Pettus	36	33
Calhoun:		
Heyser	233	258
De Witt:		
Thomaston	0	1
Hidalgo:		
La Blanca	3	5
Karnes:		
South Burnell	33	32
Jim Wells:		
Alfred	6	20
East Premont	5	5
Ben Bolt	22	51
Magnolia City	2	6
Premont	29	45
Reynolds	28	31
South Alice	92	92
Orange Grove	0	19
Wade City	0	75
Gallagher	0	3
Live Oak:		
Oakville	14	17
White Creek	8	25
Nueces:		
Agua Dulce	2	6
Bentonville	28	42
Clara Driscoll	85	118
East Flour Bluff	0	10
Flour Bluff	109	107
Luby	147	146
Minnie Bock	23	38
Saxet	512	504
Saxet Heights	85	40
Stratton	0	13
South Saxet	8	8
West Saxet	60	60
Refugio:		
Greta	214	201
La Rosa	68	77
Melon Creek	10	10
Refugio	156	126
Tomoconnor	404	427
Fox	0	18
Fagan	0	2
San Patricio:		
East White Point	157	224
Midway	10	19
Plymouth	178	179
Taft	70	69
Victoria:		
Coletto Creek	20	24
East Placedo	12	14
Keeran	19	22
McFaddin	48	60
Placedo	164	158
Victoria	0	8
Willacy:		
Willamar	0	1
Total	3,593	4,003

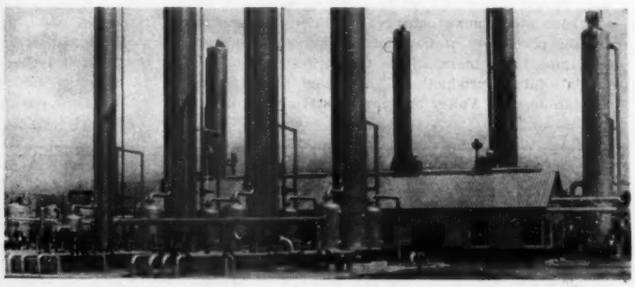
Miscellaneous Fields

Bee County:	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Caesar	44,328	121	18	18
Foley	4,101	11	4	4
Normanna	6,290	18	5	4
Plummer	43,393	113	13	11
Ray	58,465	160	11	11
Tuleta	58,703	160	19	19
Tulsita	3,493	9	1	1
Voss	2,390	6	1	2
Calhoun County:				
Port Lavaca	92	1	2	0
Duck Bay	7,995	4	0	2
Goliad County:				
Hord's Creek	8,099	22	2	2
Sarco	1,303	3	1	1
Slick	2,030	5	1	1
Weser	837	27	0	1
Hidalgo County:				
Las Mestenas	41,785	114	1	0
McAllen	5,093	13	1	1
Mercedes	5,073	13	5	5
Kleberg County:				
Baffin Bay	5,610	15	0	1
Bird Island	15,457	74	1	0
Kingsville	15,240	41	7	9
Jim Wells County:				
La Gloria	13,991	38	1	4
Camada	1,525	10	0	1
Blucher	1,220	21	0	0
Bandera	488	8	0	0
Live Oak County:				
Lucas	18,857	51	3	7
McNeil	21,515	58	5	4
Dinero	3,764	10	2	3
Nueces County:				
London	11,743	32	2	2
North Luby	20,615	56	2	3
Riverside	30,491	83	2	3
Robstown	20,617	83	1	2
Shield	14,665	40	0	3
North Agua Dulce	28,755	78	1	3
San Patricio County:				
East Plymouth	110	7	0	1
Angelita	742	26	0	0
East Mathis	6,724	26	0	1
North Odem	3,513	11	0	1
Sinton	3,567	9	1	1
White Point	12,227	33	2	2
Victoria County:				
Terrell	3,878	26	0	1
Telferner	5,536	37	0	2
Bloomington	7,018	39	0	1
North McFaddin	13,158	35	3	3
North Keeran	4,744	12	1	1
East Telferner	3,032	20	1	2
Cologne	4,638	22	0	1



Above—pressuring house Continental Oil Company's Ville Platte 8200 H.P. recycling plant. Butler Steel Building 40' x 214' x 15'.

WORLD'S LARGEST OIL FIELD CONSERVATION PLANT HOUSED IN BUTLER READY-MADE STEEL BUILDINGS



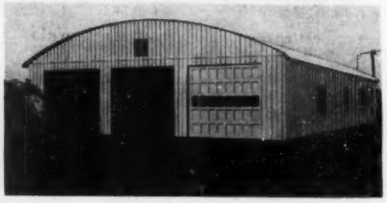
Above—the gasoline house, another of several Butler Steel Buildings housing the World's largest recycling plant.

From discovery well to settled lease Butler Steel Buildings have served in oil field development for 25 years. Now, in the new phase of oil field stabilization, gasoline recovery and pressure maintenance Butler Ready-made Steel Buildings are providing the speedy and economical solution to the recycling housing problem.

Savings in time and in money await oil companies, engineering firms, contractors — in fact all concerned in the development of recycling plants. An outline of your requirements will set Butler engineers to tailor-measuring structurally strong, fire-safe, permanent structures of any size to fit your needs exactly. Their adaptability and flexibility was well demonstrated in the housing of the World's largest recycling plant shown above. It started off with a Butler Steel Building 40' wide by 50' long, 16' high. Four times the pressuring building shown at the top was extended in length until it is now 214' long and houses equipment requiring 8200 H.P. The heavy machinery was installed first and then erection of the building followed. Should removal of the plant or any part of it become desirable, the Butler Steel Building can be taken down and re-erected on some other site.

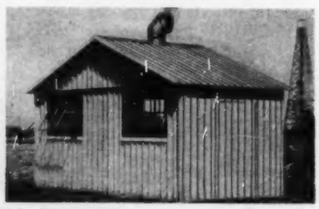
Before you build or even before you complete your plans figure with Butler engineers. Three large Butler factories enable us to offer delivery schedules that are still relatively favorable.

Above—10' x 12' Butler Steel Oil Rig Pump House.

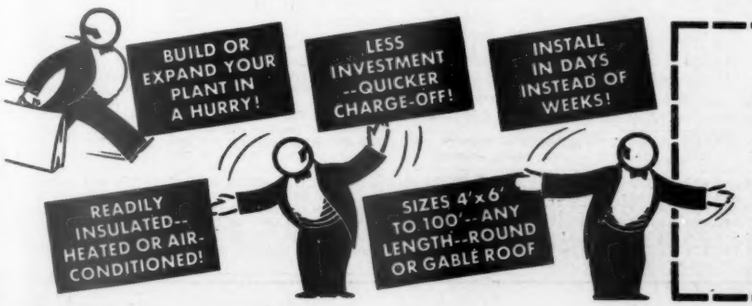


Above—40' x 74' x 10' Butler Steel Truck Garage equipped with 3 overhead doors—Somerset Gas Company, Somerset, Pa.

Above—This Butler Steel Machine Shop, located at a river-rail terminal, is insulated.



Above—Butler Steel Pump House—settled lease type.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EXPECT ACTIVE DRILLING CAMPAIGN ON COAST DURING 1941

By L. P. STOCKMAN

CALIFORNIA prospectors will undertake an aggressive exploration campaign during 1941 and with at least 500,000 acres of potentially productive land under lease throughout the state it seems quite likely that one or more new fields will be opened up before 1942 rolls around. On the basis of 1940 production and a reduction in Pacific Coast stocks of approximately 6,000,000 bbl., prospectors must discover 230,000,000 bbl. of new production during the next 12 months in order to prevent a reduction in crude-oil reserves during 1941. In past years the discovery of a new field usually meant the starting of immediate intensive development, but in recent years, with the exception of Wilmington, most of the new fields discovered have been devoid of town-lot sections and development work has been along more conservative lines. As time goes on, the possibility of town-lot drilling will become of less importance inasmuch as the largest part of California's future production is expected to come from the San Joaquin Valley and the coastal area which are relatively sparsely settled and where acreage is held in large blocks.

900 New Wells in 1941

A total of 874 new wells were completed in California during 1940 and that many of them showed prolific production is evidenced by the fact that the aggregate initial daily production of new wells totaled 765,299 bbl. A recent check indicated a minimum of 800 new wells would be drilled in California during 1941, but it is believed quite probable that the total will be nearer 900. Development work in the Northeast and Southeast Coalinga fields has settled down to normal and on this basis we may expect about 75 new wells to be completed in the Gatchell zone of Eocene age during the next 12 months. The Eocene at Kettleman Hills will also undergo normal exploitation and it is believed that about 25 deep wells and 25 more in the overlying Temblor will be completed in this field during 1941. In the southern end of the San Joaquin Valley, operators will continue to develop the productive Stevens, Rio Bravo and Vedder zones of Miocene age with good results. Richfield Oil Corp. has scheduled 50 Stevens zone wells for completion in the Coles Levee and Tupman fields during 1941 and Superior Oil Co. has commitments for 30 wells to be divided between the Rio Bravo, Greeley, Northeast and Southeast Coalinga fields. Union Oil Co. will drill about 25 wells in San Joaquin Valley fields during 1941 and Standard Oil Co. has sufficient locations available for 150 new wells although it is not likely that more than 60 will be drilled in that section of the state during the next 12 months. Standard Oil Co. has already started work on an outpost in the Hay section of the Elk Hills field in Kern County and has location staked for a second well in the same area. This exploratory work is located on fee-owned acreage and if present drilling is successful it will lead to additional development. A minimum of 50 exploratory wells will be drilled in the San Joaquin Valley during 1941 but the wildcat

CALIFORNIA CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

(Barrels of 42 U. S. gallons)

NORTHERN FIELDS—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Arvin	652,023	1,781	79,392	67,419	70,388	59,854	62,438	55,688	54,232	44,803	43,835	39,091	36,753	38,130
Belridge—North	3,861,662	10,551	349,880	329,845	343,397	327,771	330,578	323,380	315,800	331,184	300,889	310,872	295,103	302,963
Belridge—South	751,818	2,054	56,763	56,816	61,192	60,303	65,343	61,372	66,723	63,376	64,297	66,808	63,198	65,627
Canal	2,035,132	5,560	181,030	166,430	175,716	176,851	179,115	175,205	171,828	171,461	157,876	161,855	155,604	162,161
Canfield Ranch	15,607	43	1,845	1,554	1,481	1,684	1,237	1,154	1,120	1,042	955	1,204	1,153	1,178
Coalinga	9,934,521	27,144	676,003	625,527	718,532	766,550	824,617	803,799	869,449	873,773	857,865	926,332	946,816	1,045,258
Coles Levee	1,314,126	3,590	73,409	88,241	103,724	108,257	119,494	112,255	112,328	123,499	103,262	112,773	125,134	131,750
Edison	865,660	2,365	68,354	61,083	69,924	68,602	72,303	70,521	73,509	68,875	69,239	68,907	89,930	84,413
Elk Hills	4,427,359	12,097	326,874	357,548	385,841	372,622	386,384	368,241	380,973	373,324	363,200	373,717	364,713	373,922
Fruitvale	2,072,113	5,662	187,534	168,065	178,500	176,324	174,238	171,080	175,626	176,115	171,789	166,108	161,566	165,168
Greeley	1,475,721	4,032	100,591	91,957	106,652	107,299	115,781	117,069	124,265	144,430	136,406	136,526	140,117	154,628
Kern River	4,093,777	11,185	361,140	323,561	341,532	352,329	370,820	355,755	331,214	347,476	325,914	328,629	322,777	332,630
Kettleman North Dome	16,720,517	45,684	1,495,418	1,477,167	1,470,560	1,412,583	1,454,411	1,407,008	1,448,645	1,450,354	1,408,950	1,328,032	1,169,766	1,197,623
Lost Hills	1,403,679	3,835	129,189	120,518	129,916	126,081	127,458	113,989	114,183	113,584	111,374	109,559	101,994	105,834
McKittrick	1,313,844	3,589	108,437	100,326	110,166	107,077	109,916	110,361	111,378	120,268	107,597	114,948	105,273	108,097
Midway-Sunset	18,400,180	50,274	1,621,485	1,509,260	1,616,222	1,550,483	1,633,057	1,541,337	1,548,378	1,539,512	1,462,732	1,469,113	1,423,608	1,484,993
Mountain View	2,421,127	6,615	231,441	207,424	207,187	218,734	205,425	198,474	200,618	198,277	189,160	189,271	184,466	190,650
Mount Poso	3,426,616	9,362	302,047	279,365	292,472	292,745	312,880	283,629	283,677	285,104	280,338	275,349	264,970	274,040
Paloma	137,763	376	5,605	5,323	5,636	5,576	5,421	10,417	15,717	15,432	14,605	14,222	19,194	20,615
Rio Bravo	3,299,087	9,013	239,983	241,329	247,882	256,266	248,335	229,347	293,676	282,781	293,642	341,218	301,143	323,485
Round Mountain	2,689,562	7,349	239,921	220,248	228,651	218,599	221,843	212,275	215,098	230,289	215,041	229,078	225,616	232,903
Strand	527,970	1,443	40,651	33,115	43,899	41,913	50,585	47,651	48,982	49,655	44,115	42,356	41,958	43,090
Ten Section	3,517,421	9,610	262,890	244,089	269,737	266,665	277,311	286,976	294,760	304,208	304,004	327,482	330,859	348,440
Tupman	1,275,328	3,485	30,147	30,819	33,683	49,174	50,346	60,172	110,527	113,731	166,223	206,659	203,902	219,945
Wasco	576,444	1,575	34,567	42,030	40,012	43,971	49,198	50,425	49,033	44,769	55,494	54,177	55,308	57,460
Wheeler Ridge	112,917	309	9,770	9,205	9,555	9,444	9,651	9,125	9,352	9,664	9,146	9,633	9,010	9,362
Total	87,321,974	238,583	7,214,366	6,858,264	7,262,457	7,177,757	7,458,185	7,176,705	7,421,091	7,476,986	7,257,948	7,403,919	7,139,931	7,474,365
Daily average	238,583	.....	232,721	236,491	234,272	239,258	243,489	239,223	239,390	241,193	241,932	238,836	237,998	241,108
COASTAL FIELDS—														
Capitan	650,694	1,778	62,664	58,680	59,386	55,956	56,236	52,654	51,937	53,339	48,870	48,951	50,949	53,072
Elwood	1,289,183	3,522	121,472	110,791	118,812	111,802	112,016	105,443	106,256	105,840	97,995	100,239	97,085	101,432
Rincon	1,608,492	4,395	127,801	109,753	116,594	121,778	122,912	120,520	143,610	145,081	150,008	153,177	149,202	148,056
San Miguelito	1,168,082	3,191	90,735	85,689	94,472	95,362	97,314	99,083	98,183	100,555	95,351	100,507	100,781	110,050
Santa Barbara	85,372	233	8,151	5,407	10,251	7,384	6,859	6,957	6,427	7,275	6,310	6,900	6,445	7,006
Santa Maria	2,220,969	6,068	105,797	102,768	143,233	116,589	171,639	193,978	225,130	303,397	173,743	222,910	206,872	254,913
Santa Maria Valley	6,162,760	16,838	333,668	339,690	384,542	550,765	529,393	509,228	576,043	571,782	587,710	621,685	572,912	585,342
Summerland	8,533	23	887	668	862	714	671	506	740	927	757	699	511	591
Ventura Avenue	12,572,804	34,352	1,148,054	1,077,185	1,063,525	979,286	1,050,400	1,026,692	1,056,156	1,073,696	993,538	1,049,296	1,009,470	1,045,506
Ventura-Newhall	2,866,015	7,831	220,101	203,819	228,699	216,170	229,186	227,200	229,191	250,968	239,595	250,790	280,137	290,159
Watsonville	9,150	25	775	725	775	750	775	750	775	775	750	775	750	775
Total	28,642,054	78,256	2,220,105	2,093,175	2,221,151	2,256,556	2,377,401	2,343,011	2,494,448	2,613,635	2,394,627	2,555,929	2,475,114	2,596,902
Daily average	78,256	.....	71,616	72,178	71,650	75,218	76,690	78,104	80,466	84,310	79,821	82,449	82,503	83,771
SOUTHERN FIELDS—														
Brea-Olinda	2,064,905	5,642	174,036	163,894	174,147	175,262	175,341	173,061	181,300	180,313	165,802	170,122	165,994	165,633
Coyote—East	1,387,407	3,791	94,265	93,429	103,568	118,488	125,197	120,829	137,410	120,177	111,702	118,091	122,173	122,078
Coyote—West	2,666,184	7,285	217,943	176,408	201,938	186,497	195,911	200,840	241,160	247,394	206,742	251,861	265,140	274,350
Dominguez	7,667,914	20,951	608,424	569,458	603,003	615,065	658,544	649,067	664,133	688,429	651,687	677,018	653,848	629,238
El Segundo	788,640	2,155	83,664	74,697	73,749	72,304	71,616	65,437	66,849	62,976	54,228	55,580	54,313	53,227
Huntington Beach	9,592,058	26,208	849,833	799,904	846,936	810,209	782,750	773,471	774,637	786,717	789,967	801,204	768,198	808,232
Inglewood	4,368,839	11,937	401,305	359,485	398,806	373,192	379,382	361,349	368,069	358,369	341,526	345,137	334,182	348,037
Lawndale	14,778	40	1,320	1,272	1,375	1,201	1,420	1,020	1,301	1,040	1,478	1,315	951	1,085
Long Beach	15,995,238	43,703	1,427,733	1,305,148	1,373,136	1,345,666	1,352,771	1,322,994	1,343,183	1,337,739	1,304,775	1,332,719	1,268,485	1,280,889
Los Angeles-Salt Lake	195,099	533	16,810	14,865	16,351	15,675	17,193	16,070	16,521	16,094	16,612	16,890	15,588	16,430
Montebello	7,239,899	19,781	830,166	688,782	631,017	621,759	673,637	649,617	585,491	542,195	508,603	520,659	492,562	495,411
Playa Del Rey	1,506,399	4,116	135,689	122,922	131,442	131,434	132,127	122,870	123,856	126,255	121,948	119,607	119,550	118,699
Potrero	685,951	1,874	49,204	56,161	52,746	56,495	52,512	49,825	47,501	59,030	64,052	67,997	65,731	64,697
Richfield	3,224,543	8,810	271,703	253,741	286,031	279,950	288,486	273,097	284,757	285,641	271,135	277,161	222,976	229,865
Rosecrans	4,256,976	11,631	293,783	290,885	301,333	283,817	312,299	352,386	439,886	401,514	390,247	411,852	396,093	382,881
Santa Fe Springs	9,441,971	25,798	803,747	749,366	802,143	780,399	805,812	790,680	812,841	809,033	758,546	789,625	759,726	780,053
Seal Beach	2,559,998	6,995	224,992	219,423	226,911	216,420	219,957	215,120	221,399	210,612	193,712	204,325	198,528	208,599
Torrance	4,009,407	10,955	412,103	357,148	373,074	349,361	348,508	326,932	326,311	325,552	298,268	304,982	291,831	295,337
Whittier	180,278	493	30,059	29,181	31,025	29,105	19,916	5,448	5,745	6,153	5,992	5,994	5,540	6,120
Wilmington	30,203,750	82,524	2,599,149	2,365,032	2,560,003	2,506,821	2,570,292	2,534,096	2,564,509	2,600,670	2,468,406	2,506,105	2,414,350	2,514,317
Total	108,050,234	295,222	9,525,928	8,691,201	9,188,734	8,969,120	9,183,671	9,004,209	9,206,859	9,165,903	8,725,428	8,978,244	8,615,759	8,795,178
Daily average	295,222	.....	307,288	299,696	269,410	298,971	296,247	300,140	296,995	295,674	290,848	289,621	287,192	283,715
Total 1940	224,014,262	612,061	18,960,399	17,642,640	18,672,342	18,403,433	19,019,257	18,523,925	19,122,398	19,256,524	18,378,003	18,938,092	18,230,804	18,866,445
Daily average	612,061	.....	611,626	608,367	602,334	613,448	613,524	617,464	616,851	621,178	612,600	610,906	607,693	608,595
Total 1939	224,354,048	614,669	19,274,079	17,418,952	19,283,785	18,403,853	19,073,972	18,221,295	18,803,140	18,934,353	18,462,923	19,098,804	18,382,277	18,996,615
Total 1938	249,749,246	684,244	22,008,235	20,607,735	22,441,293	21,647,430	21,346,950	20,170,317	20,493,544	20,769,860	19,921,957	20,423,178	19,883,988	20,034,759
Total 1937	238,520,383	653,481	18,031,650	16,515,433	18,427,798	18,816,050	20,365,478	19,913,888	20,575,815	20,876,078	20,555,578	21,528,921	21,059,637	21,854,057
Total 1936	214,773,315	586,812	21,083,006	17,035,430	17,541,014	17,180,120	17,875,938	17,445,261	17,809,508	17,924,680	17,375,122	17,942,030	17,462,315	18,098,891

TOTAL FLUID STOCKS OF PETROLEUM HELD IN PACIFIC COAST TERRITORY (Barrels)

	Refinable crude	Heavy crude	Fuel oil	Diesel and gas oil	Natural gasoline	Gasoline	Naphtha distillates	All other stocks	Total all stocks
1938—									
December 31	36,225,312	16,282,117	70,957,881	10,539,937	2,699,455	13,259,369	1,566,349	6,153.809	157,684,289
1939—									
December 31	35,136,501	13,303,091	66,886,434	9,671,299	1,516,033	16,128,052	1.282,484	8,011,354	151,935,248
1940—									
January 31	35.457.973	13,378.972	65.990.389	9.099,950	1,662,478	16.918.562	1,289,515	7,766 883	151,564,542
February 29	35,995,435	13,405,906	65,648.712	8,980,220	1,747,755	17,678,049	1.413,829	8.339,383	153,209,289
March 31	35,804,861	13,499,792	64,947,259	9,326,881	1,875,107	17,572,852	1,565,034	8,388.953	152,980,739
April 30	35,835,610	13,520,733	65,346,750	9,679,406	2,020,627	17,645.918	1.585,311	8,494,606	154,128,961
May 31	35,721,588	13,279,151	65,101,337	9.810,933	2,210,560	17.278,777	1,709,868	8,713,600	153,825,814
June 30	35,190,264	13,340,198	65,127,849	9,733,721	2,418,391	16,264,529	1,855,903	8,775,852	152,706,707
July 31	36,116,475	13,217,848	64,319,349	9,857,816	2,627,668	14.831,909	1,888,095	9,021,682	151,880,842
August 31	36,360,453	12,818,762	63,600,163	10,112,598	2,765,839	14,458,803	1,960,407	8,804,958	150,881,983
September 30	35,367,172	12,584,562	62,840,120	10,622,136	2,752,640	14,532,495	1,865,261	8,731,693	149,296,079
October 31	35,292,981	12,351,317	61,777,967	10,621,124	2,619,397	14,274,663	1,766,386	8,738,807	147,442,642
November 31	35,040,846	12,238,745	60,903,241	10,142,821	2,548,369	14,619,376	1,794,281	8,501,975	145,789,654
December 31—to come—									

mortality will be high unless an additional line of folding is found.

Los Angeles Basin

Drilling operations in Los Angeles Basin and adjacent territory will be confined for the most part to the development of deeper zones and the drilling of outpost wells. Continued activity can be expected in the Dominguez, Huntington Beach, Long Beach, Rosecrans and Wilmington fields, where there are a number of undrilled locations available for work. The Ford zone in the Long Beach Harbor section of the Wilmington field is expected to be held back for another year due to the consistent prolific production shown by the Terminal zone during the past 12 months. The situation at Inglewood, however, was somewhat clouded at the close of 1940 with conditions pointing to the probability that aggressive deep-zone exploitation would begin before 1941 was very far advanced. The situation confronting operators in the Inglewood field centers around whether Standard Oil Co. will succeed in completing a commercial well in the Sentous zone of Miocene age that was proved up by the R. R. Bush Oil Co. a few months ago. The deep-zone discovery well, due to its unfavorable location structurally, failed to show large production and hence the importance of the Sentous zone is still problematical. If competitive deep-zone development is started in this field early in 1941 we may expect the completion of at least 100 new wells before the close of the year.

Coastal District

The coastal district, comprising Ventura, Santa Barbara and western Los Angeles counties, will undoubtedly undergo extensive exploration work during 1941. This is especially true of the Newhall-Castaic region where recent drilling has proved exceptionally successful. At least 25 wildcats will be started in this area during 1941 and with about 50 structures ranging from a few hundred acres to several thousand acres and having various structural features it is safe to assume that one or more new fields will be discovered in the Newhall-Castaic quadrangle before the close of another year. These structures, which extend across western Los Angeles County into eastern Ventura County, have been recognized for many years but until a few years ago no large flowing production had been developed. Operators consequently centered their activities in more prolific areas to the detriment of the Newhall-Castaic region. The possibilities of this area were not even appreciated when Barnsdall Oil Co. found commercial production on the Rancho San Francisco or when Tide Water Associated Oil Co. discovered the Aliso Canyon field. These discoveries were considered exceptions to the general rule. It remained for R. W. Sherman, former chief geologist of Barnsdall Oil Co., and L. D. Wosk to call the attention of operators to the productive possibilities of this area. Within 30 days after R. E. Havenstrite had completed 1 Lincoln there was not a good-looking piece of acreage available at any point along the Pico anticline. The Halsey, Del Valle and Ramona anticlines were leased solid and other minor anticlines were leased in the same general rush to secure potentially productive acreage.

Wilmington Field

The Wilmington field, which was aggressively drilled last year and which yielded 154 new wells, headed the production list followed by Midway-Sunset, Kettleman North Dome, Long Beach, Ventura Avenue, Coalinga, Huntington Beach, Santa Fe Springs and Dominguez in the order named. The Coalinga field of Fresno County, due to aggressive development in the Northeast and Southeast Coalinga sections, showed a substantial increase during 1940, but Montebello on the other hand registered a large decline due to depletion of the productive measures. The Santa Maria Valley field of Santa Barbara County, in the coastal district, produced more crude oil in December than during January, but this was because of a change effected during the period whereby the allowable production was increased. The Santa Maria Valley field, after several months of restricted activity, went back on steady production April 1, 1940, under an agreement whereby all major companies agreed to resume purchase under certain conditions.

Discoveries

Del Valle.—The most important discovery during 1940 was that made by R. E. Havenstrite on the Del Valle anticline in the Newhall-Castaic region near the Los Angeles and Ventura county lines. This discovery well was 1 Lincoln in 16-4n-17w. It was completed flowing 900 bbl. of clean 32.9-gravity oil and 4,500,000 cu. ft. of gas per day through a 16/-64-in. tubing bean and a 24/64-in. casing bean. Production is coming from the upper part of the Modelo formation of upper Miocene age.

Rosecrans.—El Rey Oil Co. found a new accumulation of undetermined importance in 1 Westmore Land northwest of the northern tip of the Rosecrans field of Los Angeles Basin in 2-3s-14w. This well, which is located along the Newport-Beverly shear zone, was finished June 1 pumping 120 bbl. of 32.5-gravity oil cutting 5 per cent. Bottom of the hole is 9,063 ft., but the effective depth is 9,000 ft. as a plug was put in the bottom of the hole before the well was placed on the beam. This well may have found a new productive interval along this major line of folding even though initial daily production was small. It is located in an area that has been prospected for a number of years without success. Within a radius of 2 miles a total of 19 wildcats were drilled between 1920 and 1940, but none of these previous tests showed commercial production. It is interesting to note, however, that none of these previous wells was carried down below 6,500 ft., and therefore they do not have any effect on the Westmore sand found below 8,632 ft. Topography consists of a relatively flat country with a series of low rolling swells in the general area.

Pyramid Hills.—Tide Water Associated Oil Co. appears to have discovered an accumulation of low-gravity oil in the Pyramid Hills section of Kings County in the San Joaquin Valley as its No. 1 West Slope, in 20-24s-18e, was completed May 31 pumping 40 bbl. per day of 16.4-gravity oil cutting 3.4 per cent. The discovery well was drilled as a structure survey hole to 2,087 ft., but when nothing was found at this depth the hole was plugged back to 950 ft. to test an oil sand cored above that point. It is one of two core holes drilled in the area and while the extent of the structure or importance of the accumulation is conjectural it would appear to be of a minor character from a production standpoint. It will require another several wells to fully determine the importance of this find. No. 1 Pyramid fee, the first core hole drilled by Tide Water Associated Oil Co. in this district, was

Field Developments in 1940

Field—	No. of wells—Jan. 1	Dec. 31
COASTAL DISTRICT:		
Capitan	45	44
Elwood	71	74
Rincon	60	74
San Miguelito	12	26
Santa Barbara	12	19
Santa Maria	150	181
Santa Maria Valley	62	141
Summerland	8	8
Ventura-Avenue	274	322
Ventura-Newhall	581	519
Watsonville	7	7
Total	1,281	1,415
LOS ANGELES BASIN:		
Brea-Olinda	384	362
Coyote—East	84	87
Coyote—West	56	78
Dominguez	170	200
El Segundo	46	39
Huntington Beach	570	547
Inglewood	219	198
Lawndale	5	5
Long Beach	1,224	1,216
L. A.-Salt Lake	105	103
Montebello	330	335
Playa Del Rey	166	146
Potrero	17	19
Richfield	300	298
Rosecrans	138	170
Santa Fe Springs	567	582
Seal Beach	115	120
Torrance	689	633
Whittier	50	38
Wilmington	739	899
Total	6,040	6,075
SAN JOAQUIN VALLEY:		
Arvin	2	15
N. Belridge	71	71
S. Belridge	118	189
Canal	31	34
Coalinga	860	906
Coles Levee	14	31
Edison	89	96
Elk Hills	193	196
Fruitvale	166	170
Greeley	25	37
Kern River	1,633	1,458
Kettleman Hills	247	265
Lost Hills	292	264
McKittrick	201	213
Midway-Sunset	2,635	2,503
Mountain View	187	176
Mount Poso	245	284
Paloma	1	5
Rio Bravo	75	69
Round Mtn.	202	225
Strand	6	8
Ten Section	40	67
Tupman	5	39
Wasco	7	12
Wheeler Ridge	9	34
Total	7,425	7,445
State total	14.746	14.935

Summary of Field Operations for 1940

Northern—	Comp.	Prod.	Dry	New Rigs
Arvin	2	2,538	...	1
Belridge—North	12	4,901	...	11
Canal	6	4,794	...	4
Coalinga	92	166,843	5	97
Coles Levee	20	13,235	3	20
Edison	10	1,136	1	9
Fruitvale	1	80	...	...
Greeley	18	41,799	...	23
Kern River	29	355	2	29
Kettleman North Dome	38	42,760	2	21
Lost Hills	3	72	1	1
McKittrick	7	950	1	10
Midway-Sunset	26	3,935	3	26
Mountain View	1	75	2	2
Mount Poso	6	590	5	12
Paloma	4	5,166	...	5
Rio Bravo	34	51,269	2	37
Round Mountain	6	1,182	5	10
Strand	4	6,792	...	2
Ten Section	37	72,116	...	40
Tupman	38	51,809	1	48
Wasco	5	15,299	1	4
Miscellaneous	...	.....	...	2
Total	399	487,696	34	414
Coastal—				
Capitan	...	.....	...	1
Rincon	13	4,102	...	14
San Miguelito	9	12,923	...	10
Santa Barbara	1	25	1	2
Santa Maria	5	3,360	4	6
Santa Maria Valley	10	5,013	2	16
Ventura Avenue	42	68,519	1	38
Ventura-Newhall	26	17,130	12	44
Total	106	111,072	20	131
Southern—				
Brea-Olinda	3	464	1	4
Coyote—East	13	3,671	...	13
Coyote—West	2	705	...	2
Dominguez	25	18,476	1	20
Huntington Beach	32	16,433	3	37
Inglewood	3	2,953	...	7
Long Beach	28	3,417	1	31
Montebello	37	12,827	...	19
Potrero	6	1,719	...	5
Richfield	7	587	2	4
Rosecrans	36	18,789	1	38
Seal Beach	4	2,804	1	5
Torrance	3	265	6	4
Whittier	1	55	1	1
Wilmington	154	83,366	...	158
Miscellaneous	...	.....	77	95
Total	354	166.531	100	452
Total all fields	859	765,299	154	997
Gas fields—				
Buena Vista Lake	1	Gas	...	...
Delano	10	Gas	...	7
Rio Vista	4	Gas	1	5
Total gas fields	15		2	12
State total	874	765,299	156	1,009

suspended at 587 ft. but was later deepened to 1,000 ft. and abandoned when it failed to show any oil sand. It is located in 18-24s-18e, about 2 miles northwest of the discovery well. Potentially productive acreage in this district appears to be held entirely by Tide Water Associated Oil Co., and for this reason development work will be along conservative lines.

Midway-Sunset. — Republic Petroleum Co. found a new accumulation of heavy crude oil in the west end of the Midway-Sunset field of Kern County in the San Joaquin Basin on June 19 when 1 C. H., in 18-32s-23e, was completed pumping 150 bbl. of 16.4-gravity oil cutting 3 per cent daily from 1,888 ft. This new well, which was started as a structure-survey hole, cored 50 ft. of oil sand at 1,838-88 ft. during the course of work and after the well had been carried down to 2,466 ft. without finding any additional oil sand it was plugged back to 1,888 ft. and put on the beam. Production is coming probably from the Santa Margarita formation of upper Miocene age, which has proved quite productive in the Mountain View and other similar districts. The discovery of Republic Petroleum Co. is generally considered to be a localized accumulation of limited extent. Republic Petroleum holds a total of 1,320 acres adjacent to the well and of this total, 320 acres are owned in fee. Chanslor Canfield Midway Oil Co. owns all other surrounding acreage, and for this reason it is believed that any production developed will be restricted to these two operators. All holdings are in large blocks and drilling operations will therefore be along well-established conservative lines.

East Coyote Deep Zone. — Bartholomae Oil Corp. proved up the existence of a new deep productive zone in the northwest end of the East Coyote field of Orange County in Los Angeles Basin June 15 by completing 9 Stern in 22-3s-10w pumping 172 bbl. of clean 26.8-gravity oil per day from 6,580 ft. Several days after completion, this deep-zone discovery well began flowing 550 bbl. per day of clean 25.3-gravity oil. Previously the East Coyote field had produced from depths ranging from 2,700 ft. to 4,155 ft. East Coyote consists of a normal anticline and production to date has come from rocks of Pliocene age. Property adjacent to 9 Stern of Bartholomae Oil Corp. is held by Standard Oil Co. and Union Oil Co. and both should have acreage within productive contours.

Crude-Oil Curtailment

Curtailment activities were intensified during 1940 with the result that the state's allotment and allowable production of top wells were consistently reduced from month to month. This consistent reduction in the maximum allowable for large wells reflects the completion of numerous prolific new wells during the period as all new production added in any month had to be offset by reducing the allowable production of wells on production during the succeeding month. The limitation placed on top wells begun in June, 1939, when the Central Committee decided that no well should be allowed to produce in excess of 250 bbls. per day. This allotment was cut 55 bbl. per day between June 1939 and January 1940, and it will be noted that during the current year the top allotment has been reduced an additional 46 bbl. daily. This combined reduction in maximum well allowable of 101 bbl. per day in 18 months was necessitated by the completion of 874 new wells during 1940. It is generally recognized that aggressive drilling has been responsible for the consistent reduction in the production of top wells as well as the reduction made each month in the state's allowable. The situation has reached the point where an operator must maintain a sufficient number of drilling wells to offset his pro rata amount of new production added by other operators or suffer a reduction in allowable production. In other words, if an operator hangs up his tools and does no drilling his allowable production will be reduced each month by an amount necessary to absorb his pro rata share of the amount necessary to offset the new production added by the completion of new wells by other operators.

Month—	Daily allotment	Maximum well allotment
January	599,000	195
February	594,000	185
March	592,000	182
April	592,000	178
May	592,000	174
June	592,000	168
July	587,000	167
August	587,000	163
September	571,000	156
October	571,000	153
November	571,000	151
December	571,000	149

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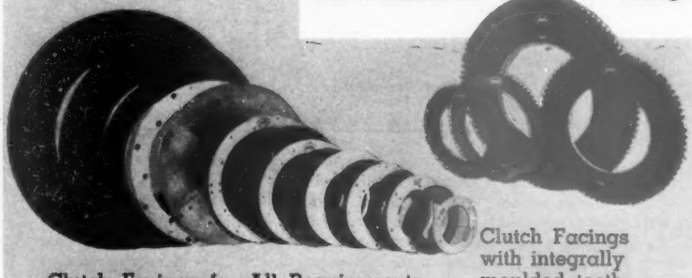

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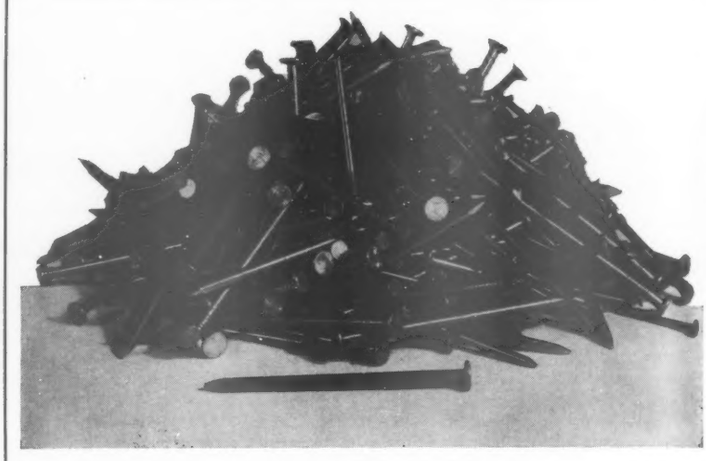

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WILCOX TREND PLAY, DEEP DRILLING FEATURE YEAR'S ACTIVITY

By GEORGE WEBER

DEVELOPMENT of an important Wilcox play through Central Louisiana, and failure of the Mississippi wildcatting campaign to uncover important new reserves, highlighted 1940 activity in the tristate and southeastern areas. Arkansas continued quiet with some upturn in wildcatting late in the year. Leasing and geophysical prospecting spread eastward from Mississippi to Alabama, Georgia and Florida, but the drilling phase of the play to the east has not yet begun.

Wilcox in Louisiana

Discovery of oil and gas in sands lying about 600 ft. below the top of the Wilcox formation in Central Louisiana reopened that area to a new exploratory campaign in 1940. Credit for the discovery goes to Arkansas Fuel Oil Co. and H. L. Hunt, who jointly drilled the deep wildcat which showed production in the new horizon. The test was third of a series planned by the former operator to explore below the top of the Wilcox. Incited by the show, Placid Oil Co., an H. L. Hunt affiliate, drilled and completed the first well in the Olla field, while the deep test drilled ahead.

Discovery of the Olla field revived interest in La Salle and surrounding parishes which had been relatively dormant during the past several years. The area had been intensively explored by shallow wildcats, but upon failure to find production in the top of the Wilcox wildcatters abandoned operations, so that deeper levels were relatively unexplored.

Olla, discovered in March, was followed by opening of production in the Standard and Summerville gas fields in June and September respectively, and the Nebo oil field in the latter month. Numerous wildcats were drilled in La Salle, Grant, Winn, Caldwell and Catahoula parishes without opening new production, but wildcatting may be considered as only well under way, with favorable chances for the opening of further production in the horizon during 1941.

By far the largest field in the new group is Olla, with nearly 100 wells at the year's end. Four sands, the upper and lower Central, Mathews and Cruse, produce oil from what is termed the Olla group, and a deeper sand, the Goodpine, was producing oil in two wells by the end of 1940.

Geophysical shooting is progressing throughout the area, and geological information on the top of the Wilcox and above furnishes good control for outlining prospects. This central and northern Louisiana area should see the most active wildcatting during 1941. Drilling, to depths of 2,200-2,500 ft. is relatively inexpensive, another factor in promoting exploration. Although this factor encourages entrance of smaller operators into the play, the fact that much of the area is held in large lumber-company tracts limits much of the play to majors and independents already holding large blocks.

Deep Drilling

The trend to deeper exploration in established shallow pools in North Louisiana, incited by success at Cotton Valley, continued through 1940, but with only normal success. Pine Island proved the greatest disappointment, the first deep test failing to find production in the Cotton Valley formation. Further exploration is under way in that structure, and the large investment in leases indicates that exploration may continue through 1941. Deep tests at Haynesville and Elm Grove also failed to find deeper production.

The Lisbon field of Claiborne Parish furnished the only success to deeper drilling, with discovery of a new gas-condensate horizon in the Cotton Valley formation, and a small oil sand just below the Pettit lime production of the field. Two tests drilled at Lisbon clarified the subsurface picture of the structure and indicated important reserves in Cotton Valley. Union Producing Co. 1-A Meadows, located near what is believed to be the top of the structure and north of Pettit production in the field, is still drilling in the Smackover formation, with limited shows of oil and gas to be tested early in 1941.

The more important well drilled in 1940 was J. D. Caruthers, tr., 1 Burgess-Simmons unit, drilled downstructure from the Union test, and the Lisbon Exploration Co. 1 Vaughn, a 1939 discovery well producing gas and condensate. The Burgess-Simmons showed thickening of Cotton Valley sands, and although completed as a gas-condensate producer, it indicates favorable oil-production possibilities further down structure. The well is also considered oil-productive in a higher section than the one in which it is now completed. The Lisbon structure appears to be of considerable size, and the knowledge added by deep drilling in 1940 should serve to encourage further exploration during the coming year.

The sole new discoveries elsewhere in North Louisiana were two gas fields. Athens, located near Homer in Claiborne Parish was discovered by Skelly Oil Co. and Sunray Oil Co. whose well produced gas and condensate from a sand in the Hosston (Travis Peak) formation and showed salt water when plugged back to an upper sand. The wildcat may be recompleted for oil production at higher levels, but for the present only gas and condensate is proven. No new operations have begun, and it is likely that further development

LOUISIANA-ARKANSAS DISCOVERIES IN 1940

North Louisiana

Field, county or parish, owner, well No.—	Location	Month comp.	Producing formation	Producing section (ft.)	Total depth (ft.)	Initial production (bbl.)	Size choke (in.)	Total wells Jan. 1, 1941	Remarks
Athens, Claiborne, Skelly Oil Co. and Sunray Oil Co. 1 Valentine	31-20-6	Dec.	Hosston Travis Peak	6,316-33	6,507	50	⅞	1	Gas-condensate field. Producing est. 3,000,000 cu. ft., still tstg.
Greenwood, Caddo, Delta Drlg. Co. 1 Dunn	24-17-16	Dec.	Ozan sd.	2,543-51	2,551	..	¼	1	Dry-gas field—produced 3,254,000 cu. ft.
Lisbon, Claiborne, J. O. Caruthers 1 Burgess-Simmons	2-20-5	Dec.	Cotton Valley	8,766-8,806	9,016	70	⅝	1	New gas-condensate horizon, producing 1,750,000 cu. ft. gas.
Lisbon, Claiborne, Oakes, Caruthers & Morelock 1 Whitman	2-20-5	Nov.	Hosston Travis Peak	5,401-05	5,428	81	¼	1	New oil horizon, probably lenticular sand. Sweet oil.
Nebo, La Salle, H. L. Hunt Oil Co. 1 Goodpine	10-7n-3e	Sept.	Wilcox	3,353-62	3,690	48	¼	7	Disc. well gasser, making 6,000,000 cu. ft., subsequent wells oil wells.
Olla, La Salle, Placid Oil Co. 9 La. Central Lumber Co.	13-10-2e	Mar.	Wilcox	2,270-76	2,983	288	7/32	97	Producing oil and gas from five sands in Wilcox. Four upper sands termed "Olla group."
Standard, La Salle, Placid Oil Co. 17 La. Central Lumber Co.	9-11-3e	June	Wilcox	2,475-85	5,097	..	..	2	Gas field, disc. well prod. 20,000,000 cu. ft.
Summerville, La Salle, Peterson Pet. Corp. 1 Tremont Lumber Co.	25- 9-2e	Sept.	Wilcox	3,162-64	4,020	..	..	1	Gas field, disc. well prod. 12,000,000 cu. ft.; show oil.

Arkansas

Fouke, Miller, Louark Producing Co. 1 W. P. Sturgis	1-17-27	June	Paluxy	3,576-3,606	9,550	792	1	2	Five failures drilled in vicinity of field.
McKamie, Lafayette, Atlantic Ref. Co. 1 Bodcaw Lumber Co.	29-17-23	June	Smackover	9,175-90	9,221	240	11/64	3	Gas-condensate field, producing 2,000,000 cu. ft. gas.
Nick Springs, Union, Delta Drlg. Co. 1 C. T. Grace	31-12-14	Feb.	Hosston Travis Peak	3,465-68	6,819	180	..	12	
Urbana, Union, Marine Oil Co. A-13 W. B. Thompson	3-18-13	Aug.	Crain sd.	3,003-10	3,060	222	⅛	9	New producing horizon.

Mississippi

Pickens, Yazoo, Kingwood Oil Co. and Exchange Oil Co. 1 R. E. Wilburn	31-12-3e	Apr.	Wilburn sd. Eutaw	4,876-85	4,885	610	2	4	Second Mississippi oil field.
Tinsley, Yazoo, Union Producing Co. 1 Powell	36-11-3	Sept.	Tuscaloosa	6,110-20	6,167	585	⅝	1	New oil horizon in field. Other sands in Eutaw formation opened; identity not definite.
Tinsley, Yazoo, Union Producing Co. 4 Perry	24-10-3	Apr.	Perry sd. Eutaw	4,880-4,908	5,035	55	Pump	3	Distinct Eutaw sand.

East Texas Border

Shelbyville, Shelby, Superior Oil Co. 4 Pickering Lumber Co.	W. J. Crane Sur.	Dec.	Paluxy	3,680-85	6,085	..	..	1	Gas field, flowed est. 8,000,000 cu. ft., still testing.

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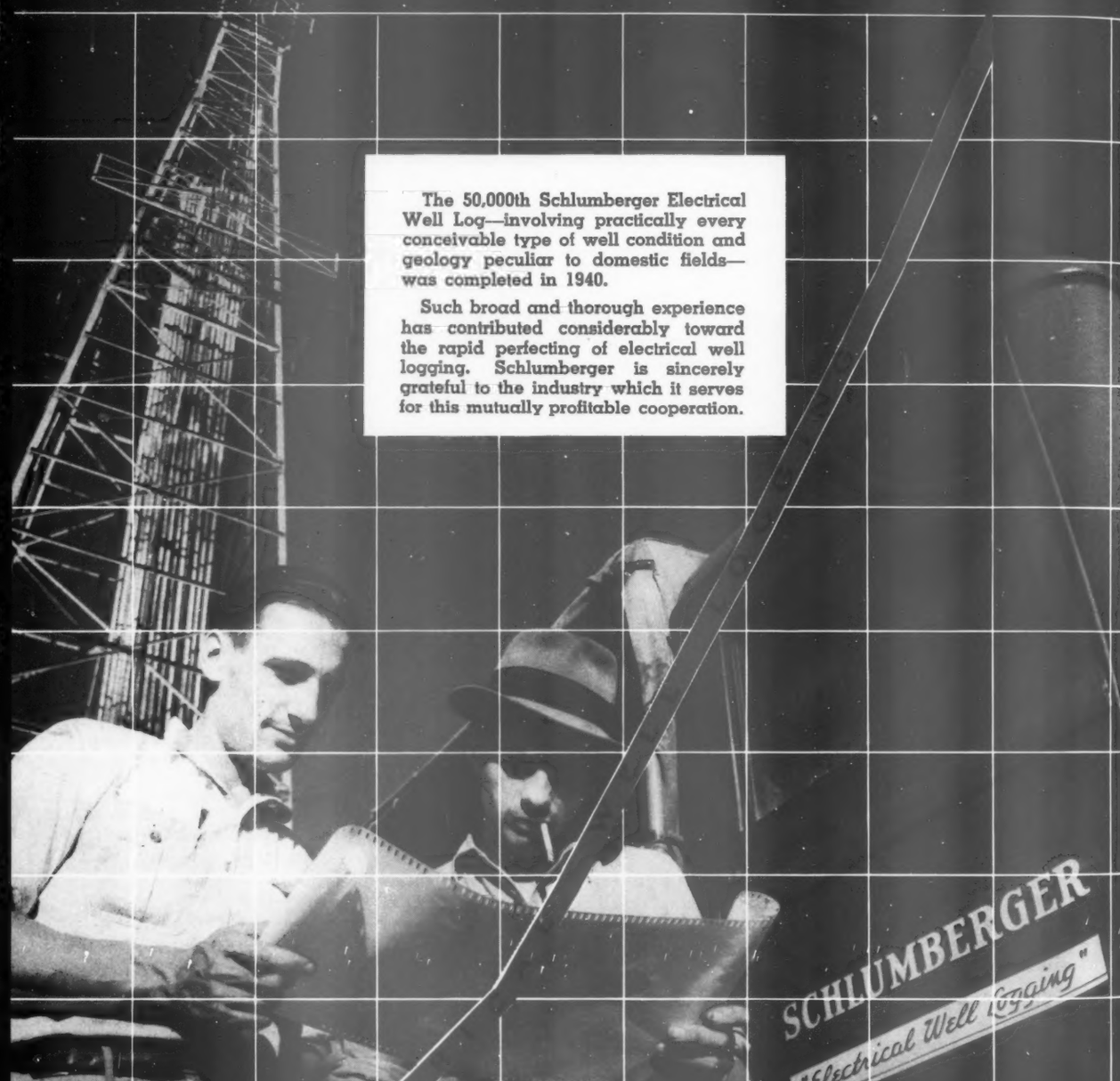

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in the area will await completion of the discovery well.

The Greenwood field, a shallow Ozan gas pool, was discovered in December when Delta Drilling Co. completed 1 Dunn after the wildcat blew out in sand at 2,543-51 ft. and was successfully closed in. The field is located near gas trunk lines and will be developed in 1941 if the market justifies.

Arkansas Quiet

South Arkansas saw a marked decline in drilling activity in 1940 due to the completion of development at Magnolia and the lack of discovery of important new production. Several of the deep Smackover lime fields, such as Dorcheat, Buckner and Atlanta were extended slightly but drilling lagged.

One new Smackover lime pool was opened during 1940. The Atlantic Refining Co. discovered McKamie in June when 1 Bodcaw Lumber Co. came in making 240 bbl. of high-gravity condensate. The depth of the pay, below 9,000 ft., makes drilling costly, and only two other wells were completed by the year's end. A drilling campaign is indicated for 1941, however, from indications early in the year. Another strong possibility for the field is the promulgating of wider spacing rules and the adoption of recycling.

A total of 10 wildcats were drilled into the Smackover lime in South Arkansas during 1940, only one of which was successful. The tests extended through the southern tier of counties; four in Columbia, three in Union and one each in Calhoun, Lafayette and Miller counties. A number of Smackover prospects remain untested, and several will probably be drilled during 1941.

Union County Active

Two discoveries in Union County revived drilling during 1940. The Nick Springs field, producing from a small lenticular sand in the Hosston formation was brought in by Delta Drilling Co. in February and 12 wells were completed in the field during 1940. Low reservoir pressure, salt-water intrusion and limited extent of proven production prevent this field from appearing important at this time, although new wells show large initial gages and development is certain to continue in 1941.

The Crain sand was opened to production in the Urbana field in August by Marine Oil Co., and a total of nine wells were completed in the new sand before the year ended. This too, is limited thus far in its extent and importance.

Field Developments in 1940

Field—	No. wells Jan. 1, 1940	No. wells Dec. 31, 1940
N. Louisiana:		
Bellevue	151	147
Caddo	1,278	1,465
Converse	77	82
Cotton Valley	158	168
Cross Lake (Shreveport)	51	50
De Soto-Red River	139	129
Elm Grove	34	36
Haynesville	287	284
Holly	4	4
Homer	353	349
Lisbon	237	212
Nebo	0	7
Olla	0	93
Pleasant Hill	29	29
Rodessa	458	444
Sarepta-Carterville, Shongaloo	27	30
Sligo	26	35
Sugar Creek	16	20
Urania	253	272
Zwolle	59	60
Total	3,637	3,916
Arkansas:		
Atlanta	6	16
Big Creek	1	1
Buckner	19	23
Champagnolle	87	79
Dorcheat	5	8
El Dorado	273	255
Fouke	0	2
Lewisville	11	18
Lisbon	149	136
Magnolia	87	115
McKamie		3
Miller Co.	15	15
Nevada	73	74
Nick Springs	0	12
Rodessa	91	77
Schuler	170	174
Smackover	1,761	1,605
Stephens	199	198
Troy	27	31
Urbana	38	52
Village	11	12
Total	3,022	2,906
Mississippi:		
Pickens	0	4
Tinsley	9	103
Total	9	107

Fouke Disappointment

Standard Oil Co. of Louisiana (now Louark Producing Co.) opened new oil production from the Paluxy in June when 1 Sturgis was completed in Miller County as the discovery well of the Fouke field. The strike touched off an active leasing play, but after the second test in the field proved a poor well and five subsequent tests near the discovery failed to find production, drilling ceased and it is doubtful that any further development will take place at Fouke in 1941.

Gas in East Texas Border

One new gas discovery and extension of high-pressure gas reserves marked a quiet year in the eastern border counties of Texas. Late in December, Superior Oil Co. produced gas near Shelbyville in Shelby County with 5 Pickering, perforated in the Paluxy formation.

The Joaquin field of eastern Shelby County and western De Soto Parish, Louisiana, was extended to the north, east and southeast in both Texas and Louisiana, and its development may be expected to highlight activity in that sector during 1941. In Panola County the Bethany and Carthage fields saw some development and the Waskom field of Harris County gained extensions to the northwest, west and southwest.

The shallow Smithland pool of Marion County gained 30 new pumping wells and another shallow pool was opened 6 miles southeast of the field.

Development of gas reserves will probably highlight this area in 1941, and increased activity may follow success in proposed wildcatting in Harrison and Shelby counties.

Mississippi and Southeastern

The greatest current leasing and wildcatting play in the nation failed to disclose any important new fields in Mississippi in 1940. One, the Pickens field of eastern Yazoo County, was discovered but development proved it limited in extent.

Altogether, 95 wildcats were drilled in the state, only one of which was a success. Excluding tests which were spudded and abandoned, however, 86 tests were failures. Many wildcats were drilled without sufficient geological or geophysical information, and the volume of wildcat drilling must not be taken as an index of the chances for finding oil in Mississippi. It is not so regarded by operators in the state, a large majority of whom are remaining and planning to pursue the wildcatting through 1941.

Wildcatting was concentrated in West Central Mis-

NORTH LOUISIANA CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

Field—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Bellevue	181,514	496	14,558	14,273	14,691	14,286	14,672	14,418	14,422	14,567	14,551	15,802	17,256	18,018
Caddo light	1,994,537	5,450	160,372	149,338	160,023	156,266	162,476	157,559	170,807	177,321	174,892	177,946	173,398	174,139
Caddo heavy	804,413	2,198	70,716	63,747	67,103	65,763	65,996	63,832	66,961	67,882	69,306	68,973	66,454	67,680
Converse	191,500	523	15,621	16,421	15,447	16,488	16,958	16,143	16,267	15,661	15,148	15,039	16,045	16,262
Cotton Valley light	1,052,736	2,876	112,748	96,391	104,351	107,197	91,903	98,083	76,111	75,638	71,854	71,605	73,052	73,803
Cotton Valley lower Marine	2,679,653	7,321	222,360	202,036	229,584	227,402	233,413	217,179	229,088	223,049	219,295	225,837	222,144	228,266
Cotton Valley distillate	1,427,402	3,900	106,676	122,472	130,343	131,013	126,756	124,502	114,084	117,485	111,902	111,594	113,251	117,324
Cotton Valley heavy	1,287	4	121	181		288	373	324						
Cross Lake	1,554,219	4,247	160,023	145,401	136,436	153,397	156,228	150,028	122,445	106,797	105,594	112,066	104,107	101,697
De Soto and Red River	371,170	1,014	33,623	28,338	30,036	28,836	31,722	31,503	32,087	31,924	31,501	30,697	30,147	30,756
Elm Grove	112,446	307	9,557	8,253	9,053	8,816	8,716	8,834	10,379	9,921	10,057	9,762	9,451	9,647
Haynesville	984,571	2,690	82,496	79,552	83,843	83,763	81,961	81,267	82,306	84,017	81,597	82,616	79,492	81,661
Holly	27,820	76	1,981	1,631	1,807	1,938	1,768	1,634	2,332	2,787	2,701	2,937	3,456	2,848
Homer	1,017,796	2,781	82,678	79,426	86,216	86,497	88,338	85,413	87,417	87,421	84,892	86,031	80,548	82,919
Lisbon	1,521,444	4,157	164,908	148,108	173,721	136,986	157,117	144,178	122,451	106,012	96,606	94,238	86,254	90,865
Nebo	50,739	139									1,498	18,914	11,845	18,482
Olla	982,363	2,684				7,166	33,516	56,114	72,842	89,751	109,648	155,779	199,585	257,962
Pleasant Hill	33,636	92	2,671	3,137	2,778	2,913	2,601	2,687	2,951	2,633	2,704	2,630	3,002	2,929
Rodessa	6,947,417	18,982	642,906	632,671	628,937	628,188	598,053	590,758	568,383	556,299	527,395	527,932	516,444	529,451
Sarepta, Carterville and Shongaloo	115,716	316	9,828	10,696	11,351	10,597	10,373	10,143	9,149	7,900	9,302	8,209	9,151	9,017
Sligo	725,175	1,981	52,688	49,798	57,781	59,136	66,752	62,004	59,360	58,282	61,194	64,171	64,807	69,202
Sugar Creek	208,489	570	13,742	19,273	22,228	23,966	25,611	19,317	7,597	3,094	3,901	21,862	25,497	22,401
Urania	898,570	2,455	76,606	60,412	87,563	85,713	74,831	76,468	76,564	74,711	74,407	72,072	68,401	70,822
Zwolle	617,962	1,688	57,626	59,196	58,537	56,688	53,383	53,348	51,616	50,537	46,947	45,261	41,842	42,981
Total	24,502,575	66,947	2,094,505	1,990,751	2,111,829	2,093,303	2,103,517	2,065,736	1,995,619	1,963,689	1,926,892	2,021,973	2,015,629	2,119,142
Daily average	66,947		67,565	68,647	68,123	69,777	67,855	68,858	64,374	63,345	64,230	65,225	67,188	68,359

ARKANSAS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

Field—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Atlanta	732,204	2,001	24,168	23,408	28,486	36,486	70,162	73,833	84,482	86,177	78,001	77,182	74,256	75,563
Big Creek	24,956	68	155	145		1,200	2,170	1,933	2,477	3,101	2,992	3,416	3,898	3,469
Buckner	822,740	2,248	78,466	71,432	63,538	66,213	72,971	68,609	72,386	72,532	72,756	61,843	60,904	61,090
Champagnolle	430,539	1,176	41,506	35,996	35,442	34,788	35,558	34,382	35,952	36,121	34,648	35,034	34,945	36,167
Dorcheat	413,789	1,131	33,698	26,211	43,901	27,547	36,103	33,953	35,656	34,098	32,254	35,645	34,494	40,229
El Dorado	610,637	1,668	52,635	47,466	51,489	50,702	54,078	52,548	51,303	50,689	49,645	50,842	48,744	50,496
Fouke	45,891	125						3,790	3,879	8,675	7,505	7,589	7,201	7,252
Lewisville	242,685	663	16,241	20,336	21,647	21,738	29,513	32,324	21,707	18,594	16,951	15,510	15,147	12,977
Lisbon	79,734	218	7,348	6,201	6,856	7,297	6,653	6,572	6,814	6,666	6,307	6,507	6,151	6,362
Magnolia	7,402,317	20,225	626,033	584,993	613,766	596,436	632,347	610,418	652,241	651,007	641,247	600,781	589,192	603,856
McKamie	71,353	195						3,040	9,605	9,294	12,444	12,556	11,857	12,557
Miller County	102,644	280	7,476	8,212	8,823	8,463	9,111	8,618	10,857	10,847	7,801	7,897	7,206	7,333
Nevada	206,387	564	17,016	16,131	17,152	16,788	16,958	17,429	17,977	17,516	17,092	17,676	16,948	17,704
Nick Springs	183,139	500		3,480	3,446	12,997	16,108	12,877	8,216	16,112	24,906	21,853	30,694	32,450
Rodessa	716,230	1,957	62,608	61,833	75,916	71,436	64,427	63,433	57,342	56,736	53,248	53,479	46,345	49,427
Schuler	6,609,747	18,059	575,309	533,716	573,653	557,267	573,565	554,348	578,156	575,048	559,504	516,610	498,752	513,819
Smackover light	615,553	1,682	56,483	50,136	52,891	53,347	54,393	52,519	51,458	50,844	48,895	49,602	46,794	48,191
Smackover heavy	5,012,460	13,695	433,988	394,463	429,471	415,836	425,422	412,252	423,309	420,820	405,002	422,524	408,001	421,372
Stephens	195,544	534	16,377	15,213	16,183	16,016	16,621	15,873	16,735	16,122	16,044	17,206	16,507	16,647
Troy	452,250	1,236	40,336	38,807	39,513	37,863	40,886	39,683	37,822	38,279	36,001	34,572	33,597	34,891
Urbana	481,896	1,317	29,106	26,426	28,467	27,738	28,583	27,669	43,394	55,801	60,007	52,697	54,001	48,007
Village	418,012	1,142	42,467	38,574	37,192	34,208	36,115	33,452	35,651	35,657	32,397	33,016	29,092	30,191
Total	25,870,707	70,684	2,161,416	2,003,179	2,147,832	2,094,366	2,221,744	2,159,555	2,257,419	2,270,736	2,215,647	2,134,037	2,074,726	2,130,050
Daily average	70,684		69,723	69,075	69,285	69,812	71,669	71,985	72,820	72,250	73,855	68,840	69,158	68,711

MISSISSIPPI CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

Field—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Pickens	287,134	785				6,689	23,581	28,522	30,185	45,721	44,163	40,140	35,219	32,914
Tinsley	3,995,174	10,916	107,776	188,622	234,052	218,566	245,466	281,763	249,435	484,646	761,163	448,692	441,104	333,889
Total	4,282,318	11,701	107,776	188,622	234,052	225,255	269,047	310,285	279,620	530,367	805,326	488,832	476,323	366,803
Daily average	11,701		3,477	6,504	7,550	7,509	8,679	10,343	9,020	17,109	26,844	15,769	15,877	11,832

sissippi in 1940, centering around Yazoo and neighboring counties. Tests were drilled in 33 counties distributed throughout the state.

Leasing, which was on the upswing at the beginning of the year, continued strong during the first half of 1940, but thereafter declined until at the end of the year, mostly selective buying on geophysical information and transfers of acreage spreads around proposed tests remained. Geophysical shooting followed the same trend, with 59 crews in the state at the first of the year, swelling to a peak of 74 in June and dropping to 28 at the end of 1940. Core drilling came into use late in the year and may be expected to play an increasingly important part in gaining control on blocks for future wildcats.

Drilling in 1941 will depend, as in other areas, upon the international situation and the demand for crude in this country. Major companies may defer wildcat exploration of their holdings if prospects in 1941 do not appear promising. The exploration will surely be slower than in 1940, but chances for success should be greatly enhanced, since far fewer promotional tests will be drilled. If no new production is discovered, it is predicted that about 50 wildcats will be drilled in the state this year. These will, as in 1940, extend throughout the state.

Tinsley Expanded

Partially offsetting the disappointing results of Mississippi's wildcatting campaign during 1940 was the marked success in extending Tinsley's production. From an estimated proven reserve of 2,400,000 bbl. at the first of 1940, Tinsley rose to 42,000,000 bbl. as now estimated, and indications are that further upward revisions will take place as a result of 1941 activity.

The Woodruff sand, principal producing horizon in the field, shows a marked thickening to the northwest, west, southeast and east from present production, and field extensions in those directions during 1940 added greatly to the field's importance. Drilling took place largely in the north and southeast ends of the field last year, and possible further extensions on the south and southwest will be watched with much interest during 1941.

In addition to the Woodruff and Stevens sands, discovered in 1939, several new horizons were opened in 1940. Two of them are distinct new sands, and the others are classed generally in the Stevens group, which lies in the Eutaw formation. The Perry sand, lying between the Woodruff and the Stevens, was opened to production in April by Union Producing Co. 4 Perry. It averages more than 20 ft. thick in wells which have penetrated it but its development has not yet progressed to the point where its true importance may be evaluated.

In September, Union Producing Co. opened the first oil production from the Tuscaloosa formation when 1 Powell came in making oil from that deeper formation. This formation too, has had insufficient development to date to determine its importance.

Pickens

The Pickens field, on its discovery in April, sparked leasing and general interest in Mississippi. It was believed from the first to be small in extent as indicated by the geophysical picture. Its importance lay in the fact that a structure as small as Pickens could produce oil, refuting the belief held by some that only the major structures, such as Jackson and Tinsley, could produce.

The field's small importance as a crude reserve was soon realized when outposts and edge tests to the four wells proved failures. The four producers at the end of 1940 were producing on the pump, and all were making water.

ARKANSAS

Summary of Wells Completed for 1940

Month—	Comp.	Prod.	Dry	Gas
January	15	2,745	5	0
February	12	3,920	3	0
March	19	3,225	7	0
April	16	3,780	4	1
May	15	3,625	4	0
June	12	2,020	5	0
July	18	2,140	7	1
August	15	675	9	0
September	17	3,690	3	1
October	15	2,630	5	1
November	16	1,577	6	0
December	9	1,969	2	1
Total 1940	179	31,996	60	5

NORTH LOUISIANA

January	46	3,385	16	7
February	34	1,850	5	7
March	56	5,081	7	5
April	45	4,770	7	3
May	51	4,110	7	6
June	57	4,130	9	8
July	53	3,020	16	7
August	41	3,890	9	2
September	78	5,050	13	10
October	68	5,300	16	8
November	82	6,699	21	9
December	57	3,759	17	5
Total 1940	668	51,044	143	77

EAST TEXAS BORDER

January	2	0	1	1
February	5	20	3	0
March	6	375	1	0
April	3	50	0	1
May	6	225	3	1
June	8	165	4	1
July	12	165	6	1
August	14	195	3	5
September	8	55	1	1
October	10	590	5	2
November	7	10	5	1
December	5	36	0	4
Total 1940	86	1,886	32	18

MISSISSIPPI

January	13	5,210	4	0
February	9	4,070	3	0
March	12	5,385	4	0
April	24	9,795	11	0
May	32	6,935	20	0
June	19	5,990	11	0
July	14	3,445	6	0
August	16	1,990	11	0
September	29	4,935	17	0
October	11	1,990	5	0
November	18	5,054	5	1
December	13	4,464	5	0
Total 1940	210	59,233	102	1

ALABAMA

June	2	0	2	0
August	1	0	1	0
September	3	0	3	0
October	4	0	4	0
December	1	0	1	0
Total 1940	11	0	11	0

FLORIDA

May	1	0	1	0
September	4	0	4	0
Total 1940	5	0	5	0

GEORGIA

September	2	0	2	0

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FORT WORTH BASIN AND OLD FIELDS SHARE YEAR'S DISCOVERIES

By R. MARNE SANFORD

THE past year was one of North Texas' most prolific in regard to new discoveries and new oil reserves added, there being 32 either new discovery spots or new horizons added in established fields. The estimated total new productive acreage added for the year from discoveries alone exceeded 6,000 acres with a total reserve of more than 36,300,000 bbl. of oil.

Despite the fact that the greatest play during the year was in the Fort Worth basin of Clay, Montague and surrounding counties, the regular rate of new discoveries for the entire district was up considerably over previous years with the majority of the 32 new discoveries being scattered throughout the various counties of the district and not definitely related to the Fort Worth basin at all.

From a geological standpoint three main structural conditions contributed mainly to the numerous discoveries during the year. First the Fort Worth basin which counted 10 either discoveries or new horizons during the year; second, the Red River uplift which resulted in the opening of seven either new fields or new levels; third, shallow, lenticular-sand lenses throughout the Cisco series as found in Clay, Wichita, Archer and Young counties; and fourth, all other discoveries which may be attributed mainly to conditions existing on the north end of the Bend arch and at the merging of the arch with the Red River uplift along the Archer and Wichita county line.

Probably most spectacular and centering most of the interest during the year was the Fort Worth basin play throughout Clay, Montague, Wise, Jack and Tarrant counties. From the spirited lease play early in the spring to the extensive wildcat-drilling programs of summer and early fall, the basin offered extremely attractive possibilities of deep production from the lower Strawn and the Bend series. As the year closed probably the most important discovery made throughout this geological structure was the Bonita field located in and around the town of Bonita in Montague County. Productive from both the Bend lime and the conglomerate of Bend age, found at approximately 5,250 ft. and 5,450 ft., respectively, there was a total of 17 wells in the field at the close of the year. The field is located on a local high along the northeastern rim of the basin and has proven to be the most consistent and therefore most prolific of any of the basin discoveries during the year. It was, of course, opened early in the year, and has been in the developmental stages for almost 9 months.

Another discovery which set off an unprecedented wave of both leasing and speculating was the Ringgold discovery in extreme western Montague County and just south of the town of that name. Opened to production from the deep Bend level at 5,700 ft., the early drilling following the discovery well established the first as being on the same large local high as the old 3,900-ft. Worsham field across the county line southwest and in Clay County. It was pointed out by geologists that probably several discoveries would ultimately be made on this large structural high. This prediction was borne out during the few months following when another and deeper level was opened in the Ringgold field and when the Hapgood field was opened to production from the Bend con-

Field Developments in 1940

North Central Texas

County & field—	No. wells Jan. 1, 1940	No. wells Dec. 1, 1940
Archer:		
Misc.	3,625	3,704
Hull-Silk	140	374
Mankins	0	12
Baylor	166	167
Clay:		
Misc.	650	715
Burns-Browning	2	3
Halsell	0	7
Cooke:		
Misc.	877	931
Voth	18	26
Walnut Bend	38	81
Foard:		
Misc.	25	8
Johnson	10	11
Jack:		
Misc.	677	636
E. Bryson	74	114
Nelson	2	3
Montague:		
Misc.	928	931
Benton-Holmes	7	11
Bonita	0	13
Ringgold	0	7
Rogers & Rogers		
King	0	33
Wichita:		
Misc.	6,132	6,114
K.M.A.	1,229	1,465
Wilbarger:		
Misc.	1,574	1,594
Consol.	16	30
Fargo	0	5
King	5	7
Young:		
Misc.	2,277	2,220
Sewell	9	22
Knight	6	12
James	0	62
Knox	0	33
Total	18,484	19,250

NORTH TEXAS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
ARCHER COUNTY—														
Old pools	3,351,539	9,157	274,175	276,268	298,560	290,045	299,174	279,723	283,898	283,503	269,250	283,497	270,121	243,325
Hull-Silk-Sikes	2,713,052	7,413	104,786	118,166	208,659	206,081	209,759	199,640	193,149	191,366	255,305	406,900	324,621	294,620
Mankins	107,080	350	.....	.....	7,344	6,785	8,041	11,028	9,938	11,691	13,181	13,908	13,118	12,046
Total	6,171,671	16,862	378,961	394,434	514,563	502,911	516,974	490,391	486,985	486,560	537,736	704,305	607,860	549,991
BAYLOR COUNTY—														
Miscellaneous	446,345	1,219	29,591	36,276	39,824	37,686	35,533	42,382	38,261	38,685	36,771	40,065	36,950	34,321
CLAY COUNTY—														
Old pools	889,822	2,431	64,832	75,289	83,029	81,547	80,794	67,676	65,619	67,753	76,109	71,391	81,218	74,565
Burns-Browning	65,699	179	6,189	6,683	9,330	8,100	6,965	5,550	4,360	4,325	3,900	3,325	3,685	3,287
Halsell	26,257	285	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,285	9,440	8,532
Total	981,778	2,682	71,021	81,972	92,359	89,647	87,759	73,226	69,979	72,078	80,009	83,001	94,343	86,384
COOKE COUNTY—														
Old pools	1,546,647	4,226	120,657	130,108	140,927	135,087	138,103	126,470	126,750	126,596	121,131	132,608	128,892	119,318
Voth	81,441	222	15,956	8,456	8,392	4,935	5,575	5,464	5,903	5,989	4,753	5,689	5,361	4,968
Walnut Bend	1,264,679	3,455	72,597	39,013	91,471	110,594	114,117	59,634	76,468	102,490	161,670	179,535	138,696	118,394
Total	2,892,767	7,915	209,210	177,577	240,790	250,616	257,795	191,568	209,121	235,075	287,554	317,832	272,949	242,680
FOARD COUNTY—														
Old pools	21,403	58	941	1,122	1,223	1,262	1,334	1,013	1,002	1,108	2,448	2,821	3,775	3,354
Johnson	142,726	390	13,539	12,530	12,382	12,635	11,719	10,860	10,942	11,237	12,038	12,134	11,894	10,816
Total	164,129	448	14,480	13,652	13,605	13,897	13,053	11,873	11,944	12,345	14,486	14,955	15,669	14,170
JACK COUNTY—														
Old pools	1,297,135	3,544	115,769	127,359	136,169	127,652	117,536	105,599	99,722	97,150	95,945	102,694	88,219	83,321
East Bryson	673,645	1,841	50,173	40,649	59,636	60,855	66,015	53,674	53,372	52,137	57,310	71,071	56,336	52,417
Nelson	28,216	77	4,034	2,063	2,147	2,534	2,685	1,994	1,300	2,147	2,436	2,365	2,393	2,119
Total	1,998,996	5,462	169,976	170,071	197,952	191,041	186,236	161,267	154,394	151,434	155,691	176,130	146,948	137,856
MONTAGUE COUNTY—														
Old pools	1,699,937	4,645	139,373	143,792	153,920	153,087	155,123	148,438	147,479	139,367	137,424	134,920	127,669	119,345
Benton-Holmes	116,868	319	7,021	6,038	7,335	6,900	6,212	5,703	7,360	7,158	12,912	16,634	17,639	15,936
Rogers & Rogers	691,941	1,891	30,295	16,988	30,831	45,063	46,739	42,149	46,113	48,210	113,924	109,336	85,842	76,451
Bonita	126,625	828	.....	.....	.....	.....	.....	.....	.....	14,189	25,121	30,940	30,091	26,284
Ringgold	34,205	372	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,870	11,463	10,872
Total	2,669,576	7,294	176,689	166,818	192,086	205,050	208,074	196,290	200,972	208,924	289,381	303,700	272,704	248,888
WICHITA COUNTY—														
Miscellaneous	209,069	571	20,574	21,601	12,314	22,132	11,823	12,593	30,283	21,714	15,440	14,098	13,654	12,843
Burkburnett	1,852,010	5,060	151,126	145,174	161,574	151,863	163,308	154,080	144,600	150,650	161,250	159,990	152,250	156,145
Electra	2,961,976	8,093	245,486	242,644	266,846	252,237	260,028	245,340	243,350	242,420	237,500	247,225	235,550	243,350
K.M.A.	11,496,885	31,412	788,697	1,097,730	1,208,822	1,100,819	1,049,631	920,126	822,615	778,342	887,489	1,106,423	872,066	864,125
Total	16,519,940	45,136	1,205,883	1,507,149	1,649,556	1,527,051	1,484,790	1,332,139	1,240,848	1,193,126	1,301,679	1,527,736	1,273,520	1,276,463
WILBARGER COUNTY—														
Old pools	2,823,714	7,715	243,050	248,076	266,018	256,914	261,512	234,457	234,921	227,697	217,887	223,659	210,612	198,911
Consolidated	446,818	1,221	21,678	32,919	41,340	35,969	43,649	42,591	37,123	37,572	34,762	40,828	40,955	37,482
King	33,460	91	3,952	4,659	4,486	3,473	3,480	3,384	1,385	537	973	1,860	2,540	2,731
Fargo	5,800	62	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,125	1,915	1,760
Total	3,309,792	9,043	268,680	285,654	311,844	296,356	308,641	280,432	273,429	265,806	253,622	268,472	256,022	240,884
YOUNG COUNTY—														
Old pools	3,113,788	8,508	278,514	281,888	297,220	285,270	297,131	270,528	252,450	251,015	254,472	228,101	225,388	191,811
Sewell	237,807	650	14,946	11,688	21,205	23,206	24,151	19,835	18,618	17,523	19,411	24,090	22,015	21,119
Knight	117,860	322	6,423	7,749	9,982	9,809	9,928	8,376	8,725	9,202	11,287	12,752	12,784	10,843
James	80,443	874	.....	.....	.....	.....	.....	.....	.....	.....	.....	28,840	25,279	26,324
Knox	65,064	707	.....	.....	.....	.....	.....	.....	.....	.....	.....	22,536	22,352	20,176
Total	3,614,962	9,877	299,883	301,325	328,407	318,285	331,210	298,739	279,793	277,740	285,170	316,319	307,818	270,273
Total district	38,769,956	105,929	2,824,374	3,134,928	3,580,986	3,432,540	3,430,065	3,078,257	2,965,726	2,941,773	3,242,099	3,752,515	3,284,783	3,101,910
Daily average	105,929	.....	91,108	108,101	115,516	114,418	110,647	102,609	95,669	94,896	108,070	121,049	109,493	100,062

glomerate just west of the Ringgold field and just north of the Worsham field. As the year closed exploration was still expected to open more production relative to this structure.

Another major step in advancing the Fort Worth basin was the discovery of the Hults-Owens field in southwestern Montague County, the southernmost point of actual production in the basin as of the close of the year. It is the deepest producing spot in North Texas and found production in the Nocona lime of the Bend series from 6,016-50 ft. and was completed for 1,085 bbl. of oil in 12 hours.

Red River Uplift

A long-prominent structural condition paralleling the Red River from Cooke County to northern Clay County and thence westward through Wichita, Wilbarger and Foard counties, the Red River uplift was credited with seven new strikes during the past year. Definitely the most promising at the close of the year was the Fargo field of northern Wilbarger County and on the north flank of the major structure. Opened by Amerada 1 Goodpasture, late in October, the field already has a total of three producing levels, ranging in depth from 3,200 ft. to 4,460 ft. throughout the Strawn series of Pennsylvanian age. There are seven wells in the field which covers an estimated 1,120

DISCOVERIES IN NORTH TEXAS DURING 1940

County, discovery well, location—	Date	Depth	Gage	Formation	No. wells	Name pool	Remarks
Jack, Cooper-Steed 1 W. J. Mathis, 4 mi. E of Bryson field	Feb. 14	2,860-84	250 bbl.	Byson sand	8	Cooper-Steed	
Montague, Sinclair Prairie 1 W. B. Howard, 2 mi. W of Bonita	Feb. 26	5,241-49	2,116 bbl.	Bend of Penn.	8	Bonita	
Montague, W. B. Omohundro 1 Wilmer Seay, 4 mi. S of Ringgold	Mar. 11	5,690-5,704	1,920 bbl.	Bend of Penn.	6	Ringgold	
Clay, E. C. Norwood 5 Taylor, Lot 39, Bacon subdivision	Mar. 16	1,200	76 bbl.	Cisco series of Penn.	14	South Costley	
Baylor, Hall-Jordan Oil 1 Green, 4 mi. SE of Seymour field	Apr. 1	3,061-64	194 bbl. in 6 hr.	Palo Pinto (Can.) Penn.	4	Hall-Jordan	
Montague, Sinclair Prairie 2 Howard, W. Wallace Sur., Abst. 841	Apr. 10	5,443-56	548 bbl. in 3 hr.	Bend cong. of Penn.	9	.....	Deep level for Bonita field.
Wichita, Fain-McGaha Oil 16-E Griffin, SW part of K.M.A. field	Apr. 15	4,352-89	2,450 bbl.	Ellenburger of Ord.	2	K.M.A. Deep	Second well 1½ mi. SE was small well and ran 63 ft. low.
Archer, Cochran & Cain 3-B Wilson, in Hull-Silk field	May 14	1,200	110 bbl.	Cisco series of Penn.	15	.....	New level for Hull-Silk.
Clay, Akin, Dimmock & Costley 1 McIness, Byers Bros. subdivision	June 3	1,075	50 bbl.	Cisco series of Penn.	24	McIness	
Clay, Akin, Dimmock & Costley 1-C Taylor, just 1 mi. from Costley field	July 10	1,025	75 bbl.	Cisco series of Penn.	10	Taylor area of Costley field	Separated from Costley field by several dry holes.
Montague, Sinclair Prairie 1 Benton, 1 mi. E of Nocona	July 12	5,120-35	58 bbl. in 3 hr.	Bend of Penn.	2	Benton	
Clay, E. C. Norwood 1 K. N. and L. P. Hapgood, Marion C.S.L. Sur.	July 15	5,972-84	2,095 bbl.	Bend cong. of Penn.	3	Hapgood	
Young, A. T. Strong 1 Craig, N. Lynch Sur., 2½ mi. NE of Graham	July 20	4,339-44	1,900 bbl.	Marble Falls (Bend) P.	3	Strong	
Foard, Thomason Oil & Royalties 1 Gamble, 8 mi. NE Crowell	July 30	2,345-69	38 bbl. oil, 144 bbl. wtr.	Upper Canyon of Penn.	5	Allee	
Archer, Chapman & McFarlin 7-E Wilson, NW part of Hull-Silk field	Aug. 3	4,636-50	1,020 bbl.	Caddo L. (Bend) Penn.	8	.....	Another deep level for Hull-Silk field.
Archer, Walter Gant 1 Vogtsberger, German Emigration Lands Sur.	Aug. 8	4,651-4,728	984 bbl. in 12 hr.	Strawn series of Penn.	2	Vogtsberger	
Archer, Bert Ligon 4-C Wilson, Lot 9, American Tribune New Colony Sur.	Aug. 18	926 & 1,300	120 bbl.	Cisco series of Penn.	14	Holliday	Located just southeast of Hull-Silk field.
Montague, Fain-McGaha Oil 1 Spring in Ringgold field	Aug. 27	5,789-94	430 bbl.	Lower Bend cong. of Penn.	1	.....	About 90 ft. below regular level in Ringgold field.
Young, George Keith 1 Rogers, Sec. 219, T.E.&L. Sur.	Oct. 12	850	250 bbl.	Cisco series of Penn.	13	Rogers	Only 3 dry holes in this shallow field.
Wilbarger, Amerada 1 Goodpasture, 15 mi. NW of Vernon	Oct. 20	3,225-47	485 bbl.	Strawn of Penn.	4	Fargo	
Archer, Shell 1 Coleman, Lot 3, Blk. 74, A.T.N.C.L. Sur.	Oct. 28	5,009-58	2,040 bbl.	Caddo L. (Bend) Penn.	1	Coleman	
Young, T. D. Humphrey 3 S. R. Jeffery, 1 mi. S. James field	Oct. 29	4,810-45	200 bbl.	Mississippian lime	1	.....	Located in an old shallower field.
Clay, Horton & Higgins et al 1 Howard, 3 mi. S Halsell field	Nov. 4	5,460-88	133 bbl.	Caddo L. (Bend) Penn.	1	Howard	First showed for discovery well in September.
Montague, Hults & Owens 1 Tucker, T.E.&L. Sur., 6 mi. NW of Bowie	Nov. 13	6,016-50	1,085 bbl.	Nocona L. (Bend) Penn.	1	Hults-Owens	
Archer, Kadane Trust 1 Griffin, Sec. 13, Palo Pinto C.S.L. Sur.	Nov. 20	4,337-51	344 bbl.	Lower Strawn of Penn.	1	.....	Different pay level than Griffin field.
Wilbarger, Amerada 1 Parker, 1 mi. S of Fargo field discovery well	Nov. 22	4,407-66	93 bbl. in 11 hr.	Strawn of Penn.	2	.....	New and deeper level for Fargo field.
Archer, Young Woody 1 Meade, W. S. Blount Sur., Abst. 13	Dec. 14	954-58	80 bbl.	Cisco series of Penn.	4	Young & Woody	
Wichita, Dorian & Barnes 1 Barnes, 1 mi. NW of K.M.A.	Dec. 19	4,008-50	73 bbl.	Lower Strawn of Penn.	2	.....	Probable link between K.M.A. and Consolidated fields
Jack, Continental 1 Robertson, J. Swan Sur., 6 mi. SE of Bryson field	Dec. 20	5,340-86	88 bbl. in 12 hr.	Lower Miss. L. and upper Ellenburg. L.	1	.....	Flow declines and well started deepening.
Wilbarger, Amerada 1-B Dodson, in Fargo field	Dec. 29	3,982-4,002	113 bbl. in 3 hr.	Middle Strawn of Penn.	1	.....	New shallow level for Fargo field.
Young, Kerlyn Oil 1 Dalrymle, Sec. 1951, T.E.&L. Sur., 2 mi. S of Loving	Dec. 30	2,922-53	458 bbl.	Strawn series of Penn.	1	.....	
Wilbarger, Big Six Oil 1 A. P. Morris, Sec. 3, Blk. 14, H.&T.C. Sur.	Dec. 31	2,898-2,911	Est. 100 bbl., still tstg.	Canyon series of Penn.	1	.....	

DISCOVERIES IN WEST CENTRAL TEXAS DURING 1940

County, discovery well, location—	Date	Depth	Gage	Formation	No. wells	Name pool	Remarks
Callahan, A. A. Hutton 1 A. A. Slaughter, Asylum Lands Sur.	Jan. 5	380	40 bbl.	Cisco series of Penn.	8	Slaughter area of N Putnam	
Taylor, Tal Vez Oil 1 M. D. Richards, S of town of View	Jan. 30	2,329-95	310 bbl.	Cisco series of Penn.	4	South View	Just S of View gas field.
Coleman, C. E. Berry 1 Dibrell, S part of Sec. 265, Joseph Hicks Sur.	Feb. 14	2,692	20	Strawn series of Penn.	2	Gayle	
Haskell, K. B. Nowles 1 Pardue, extreme S part of county	Feb. 15	3,394-3,404	30 bbl.	Palo Pinto (lower Can.)	3	Nowles	Field is developing on both sides of Jones and Haskell Co. line.
Jones, T. D. Humphrey 1 W. V. Triplett, C SE SE J. J. Hughes Sur.	Apr. 11	2,185-95	288 bbl.	Cook sand (Cisco)	2	Triplett	
Jones, John E. Farrell 1 F. D. Reid, Deaf & Dumb Asylum Lands Sur.	Apr. 22	2,567-70	150 bbl.	Gunsight L. (Cisco)	6	Reid	
Shackelford, Ungren & Frazier and Beams Drilling Co. 1 Jackson, Sec. 85, Blk. 12, T.&P. Sur.	May 24	920-28	150 bbl.	Cisco series	6	Jackson	Has 6 oil well and 5 dry holes.
Jones, Jones-Stasney and Groover-Rose 1 B. C. Humphrey, 1 mi. N. Griffin field	July 7	1,708-20	192 bbl.	Flippen sand (Cisco)	1	Humphrey area	3 dry offsets have been drilled.
Eastland, Groover-Rose et al 1 McElreath, Blk. 3, H.&T.C. Sur.	July 9	2,963-3,035	111 bbl.	Caddo lime (Bend)	2	McElreath	
Callahan, Huylar Lee 1 Harris, 6 mi. NW of town of Baird	July 10	1,219-29	50 bbl.	Tannehill sand (Cisco)	2	Harris	
Shackelford, L. H. Choate 1 Dyer, Blk. 12, T.&P. Sur.	Aug. 23	1,177-85	36 bbl.	Hope sand (Cisco)	3	.....	Has 3 oil wells and 3 dry holes.
Stephens, Horwitz & Oldom 4 Maury, J. Koehler Sur., C of Stribling field	Aug. 25	4,588-4,694	1,182 bbl	Mississippian lime	2	Stribling Deep	Deep level for Caddo lime Stribling field.
Shackelford, Hickok & Reynolds 1 A. J. Swenson, C. C. Bruff Sur.	Sept. 18	1,498-1,504	31 bbl.	Cisco series	1	Swenson	
Jones, King Oil 1 Olson, 1½ mi. N of Avoca field	Sept. 30	3,217-37	263 bbl. in 8 hr.	Palo Pinto L. (Canyon)	2	Olson	
Jones, T. D. Humphrey 3 Triplett, SE part J. J. Hughes Sur.	Oct. 12	2,465-76	298 bbl.	King sand	2	Tripplett King Level	NW offset to discovery well in Triplett field Cook sd. in Apr.
Shackelford, Kittery Oil 1 Hendrick, NW part of county	Oct. 16	1,605-12	9,750,000 cu. ft. gas	Cisco series	1	.....	
Jones, J. D. Sandefer, Jr. 1 L. R. Weinke, extreme SW of county	Nov. 2	2,584-87	40 bbl.	Cisco series	1	.....	3 dry holes drilled in the area.
Brown, Hogan & Stewart 1 J. H. Perry, Sec. 1, Blk. 1, E.T. Sur.	Nov. 10	900-13	8 bbl.	Canyon series	2	Hogan-Stewart	
Shackelford, John E. Carson 1 R. A. Elliott, SE cor. Sec. 48, B.A.L. Sur.	Nov. 12	3,615-50	20 bbl.	Caddo lime (Bend)	1	Carson-Elliott	
Shackelford, Fortex Oil 1-A Newell, 6 mi. W Albany	Dec. 18	1,116-87	40 bbl.	Hope sand (Cisco)	2	Newell	
Jones, Danciger Oil & Refg. 1 Kelso, Godwin sub., De Witt C.S.L. Sur.	Dec. 24	2,335-41	139 bbl. in 16 hr.	Cook sand (Cisco)	1	Kelso	

acres of proven area (including all three levels) and has been estimated to contain an oil reserve of more than 6,500,000 bbl. alone.

Other discoveries along this uplift include the Allee field in Foard County opened in July and also the Morris area which was still in the testing stages at the close of the year. The deep discovery in the K.M.A. field of Wichita County is related partly to the uplift and partly to the Electra arch which is a branch of the main uplift. Production was opened from the Ellenburger lime at 4,350-4,400-ft. level about mid-April by Fain-McGaha Oil Corp. 16-E Griffin, Spillers Survey. Magnolia drilled the second producer in the deep level 1½ miles southeast of the discovery and completed it for a small pumping well from a section of saturation believed to be the same as found in the discovery but encountered some 63 ft. lower structurally. No further drilling has been done to the deep level to date.

Lenticular Sands in the Cisco Series

Although adding no great oil reserve for the district but maintaining the district as a source of a great deal of shallow production, the Thornberry area of Clay County accounted for three small Cisco sand discovery spots during the year. The Costley field was opened to production in 1939 by the discovery of shallow production from the 1,050-ft. level. During the past year three new spots, all within about a mile of the original field, have been opened to production from depths ranging from 1,025 ft. to 1,200 ft. Each is a small field and confined by several failures. Continued drilling will undoubtedly open more small 10 to 15-well shallow fields in the Thornberry district.

Field Developments in 1940

West Central Texas

County & field—	No. wells Jan. 1, 1940	No. wells Dec. 1, 1940
Brown	878	895
Callahan:		
Misc.	1,183	1,208
Scranton	6	8
Coleman:		
Misc.	339	330
Anzac-Morris	(*)	5
Gayle	(*)	2
Goldsboro	(*)	9
Novice	(*)	6
N. Novice	5	22
Comanche:		
Misc.	70	60
Amity	39	46
Eastland	469	458
Erath	18	19
Fisher	149	142
Haskell	10	9
Jones:		
Misc.	207	190
Akard	1	7
Appling	4	4
Avoca	56	55
N. Avoca	0	3
Griffin	67	66
Hawley	70	65
Lewis-Steffins	117	179
Nolan	1	0
Palo Pinto	150	147
Shackelford:		
Misc.	1,872	1,944
Ivy	72	80
Stephens:		
Misc.	613	605
Loving	1	4
Stribling	5	13
Stonewall:		
Aspermont	0	1
Boyd	1	1
Carlile	1	2
Taylor:		
Misc.	13	9
Bowles	12	12
Lake Kirby	0	5
Southview	0	5
Throckmorton	136	152
Runnels:		
Beddo	2	4
McMillan	14	9
Total	6,631	6,826

*In miscellaneous.

Another major shallow discovery of the year was the Holliday field just southeast of the deep Hull-Silk field in northern Archer County. With the field centering around Section 40 of the A.T.N.C.L. Survey, production is obtained from several different pays ranging from 926 ft. to 1,300 ft. There were 14 wells in the field at the close of the year.

Bend Arch Discoveries

Almost all other discoveries in the district were in some way related to the Bend arch and its truncation by the Red River uplift in northern Archer and southern Wichita counties. Adding the greatest single amount of new oil to the district's reserve during the year was the discovery of the Caddo lime production in the Hull-Silk field. Discovered by Chapman & McFarlin 7-E Wilson, in the E. Hall Survey, northwest part of the field, the Caddo lime level at approximately 4,650 ft. had expanded to embrace a total of 1,000 acres proven by the end of the year and added a new reserve of about 9,000,000 bbl. Most of the drilling in the field is still to the original 3,800-ft. and 4,300-ft. levels; however, the new deep level offers its greatest possibilities on the southwest end of the field where 3,800-ft. and 4,300-ft. production tends to pinch out.

Another major discovery was the Cooper-Steed field in Jack County opened early in February by Cooper & Steed 1 Mathis, just 4 miles east of the Bryson field. With a total of eight producers at the end of the year, considerable drilling is predicted for the area during 1941.

WEST CENTRAL TEXAS

There was a total of 21 discoveries in West Central Texas during 1940, either new producing spots or new levels in established fields; however, as usual in the district, a great majority of them were from the

WEST CENTRAL TEXAS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
BROWN COUNTY—														
Miscellaneous	521,839	1,426	41,967	41,457	45,651	44,709	45,718	44,195	45,394	44,313	43,123	43,466	41,517	40,329
CALLAHAN COUNTY—														
Old pools	380,651	1,040	29,822	30,692	34,025	34,022	35,105	32,652	32,937	32,126	30,391	31,148	29,915	27,816
Scranton	29,388	80	2,232	1,780	2,934	2,977	2,658	2,593	2,923	2,675	2,484	2,475	1,915	1,732
Total	410,039	1,120	32,054	32,482	36,959	36,999	37,763	35,245	35,860	34,801	32,875	33,623	31,830	29,548
COLEMAN COUNTY—														
Old pools	312,138	853	31,529	30,970	34,020	32,070	26,221	24,006	23,339	23,191	21,766	22,307	21,903	20,816
Anzac-Morris	38,213	139	.....	.....	.....	2,015	4,400	4,225	4,133	3,789	5,161	4,888	4,948	4,654
Gayle	5,930	18	.....	440	400	229	475	375	782	800	584	662	601	582
Goldsboro	54,592	222	.....	.....	.....	.....	8,239	6,438	6,265	5,875	7,509	7,238	6,709	6,319
Novice	51,126	140	5,097	4,156	5,097	5,685	7,281	4,324	4,001	3,244	2,711	3,561	3,187	2,782
North Novice	127,582	596	.....	.....	.....	.....	.....	3,451	10,466	18,736	23,620	27,028	23,857	20,424
Total	589,581	1,608	36,626	35,566	39,517	39,999	46,616	42,819	48,986	55,635	61,351	65,684	61,205	55,577
COMANCHE COUNTY—														
Old pools	22,986	63	1,794	1,931	1,861	1,810	1,947	1,940	2,395	2,243	1,912	2,053	1,610	1,490
Amity	87,139	238	7,570	7,243	9,481	8,556	8,176	7,543	7,372	7,290	6,587	6,415	5,768	5,138
Total	110,125	301	9,364	9,174	11,342	10,366	10,123	9,483	9,767	9,533	8,499	8,468	7,378	6,628
EASTLAND COUNTY—														
Miscellaneous	912,679	2,494	80,024	76,540	79,571	77,524	78,694	75,881	76,498	75,739	75,058	75,274	72,555	69,321
ERATH COUNTY—														
Miscellaneous	27,716	76	2,055	1,874	2,119	1,926	2,216	2,129	2,544	2,615	2,615	2,696	2,508	2,419
FISHER COUNTY—														
Miscellaneous	811,744	2,218	75,485	75,459	79,640	73,038	76,706	66,320	62,977	63,989	60,951	62,271	58,936	55,972
HASKELL COUNTY—														
Miscellaneous	17,426	48	1,589	1,548	1,725	1,723	1,555	1,426	1,417	1,289	1,264	1,350	1,323	1,217
JONES COUNTY—														
Miscellaneous	824,576	2,253	128,170	128,014	133,259	135,267	50,414	39,367	36,882	36,113	35,628	33,253	35,098	33,111
Akard	30,875	84	2,512	2,175	2,054	2,184	2,573	2,107	2,379	2,167	3,032	3,202	3,306	3,184
Appling	40,038	109	4,970	4,689	4,600	4,340	3,650	3,000	3,072	2,816	2,688	2,513	1,968	1,732
Avoca	415,120	1,134	43,938	41,000	44,261	47,101	43,958	33,732	28,618	27,495	24,677	28,884	26,545	24,911
Griffin	627,816	1,715	51,553	50,422	54,032	56,945	52,368	42,766	37,375	34,214	41,905	88,780	65,143	52,313
Hawley	134,443	367	12,337	12,628	12,844	12,368	11,960	11,211	11,020	11,069	9,989	10,072	9,761	9,184
Lewis Steffins	604,163	1,651	45,000	45,000	45,000	45,000	58,056	47,264	44,547	41,175	59,977	71,263	55,567	46,314
Sayles	325,414	889	32,000	30,000	28,000	26,000	24,441	27,086	27,027	24,451	29,506	26,553	25,999	24,351
Reid	2,614	43	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,005	1,609
North Avoca	4,637	76	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,522	3,115
Total	3,009,696	8,223	320,480	313,928	324,050	329,205	247,420	206,533	190,920	179,500	207,402	264,520	225,914	199,824
NOLAN COUNTY—														
Miscellaneous	650	2	124	96	192	96	48	.....	94	.....	.....	.....	.....	.....
PALO PINTO COUNTY—														
Miscellaneous	127,855	349	11,600	10,985	12,149	10,917	11,194	10,315	10,897	9,582	9,673	10,513	10,216	9,814
RUNNELS COUNTY—														
Beddo	20,130	55	1,270	1,445	1,901	1,487	1,734	1,442	1,701	1,685	1,315	2,121	2,047	1,982
McMillan	17,166	47	1,682	1,833	1,751	1,494	1,616	1,603	1,727	1,367	1,133	1,399	845	716
Total	37,296	102	2,952	3,278	3,652	2,981	3,350	3,045	3,428	3,052	2,448	3,520	2,892	2,698
SHACKELFORD COUNTY—														
Old pools	1,767,628	4,830	147,608	145,336	156,309	151,947	154,227	146,644	149,742	148,561	143,456	150,317	142,134	131,347
Ivy	519,890	1,420	52,607	47,472	53,615	47,854	48,391	44,132	39,856	36,965	36,433	36,954	40,429	35,182
Total	2,287,518	6,250	200,215	192,808	209,924	199,801	202,618	190,776	189,598	185,526	179,889	187,271	182,563	166,529
STEPHENS COUNTY—														
Old pools	1,183,298	3,233	97,759	101,617	105,445	102,040	104,845	98,483	100,926	97,957	96,077	95,480	93,552	89,117
Loving	35,111	96	810	1,305	2,825	2,900	3,198	3,829	3,648	3,300	3,192	3,530	3,390	3,184
Stribling	93,351	255	4,132	7,657	8,208	9,146	10,182	8,019	8,621	8,438	8,656	10,215	4,960	5,117
Total	1,311,760	3,584	102,701	110,579	116,478	114,086	118,225	110,331	113,195	109,695	107,925	109,225	101,902	97,418
STONEWALL COUNTY—														
Aspermont	8,018	52	.....	.....	.....	.....	.....	.....	.....	1,906	1,771	1,986	1,253	1,102
Boyd	7,965	22	922	831	928	735	686	641	549	651	531	521	509	461
Carlile	22,818	62	837	740	717	1,983	2,741	2,131	3,328	1,796	1,846	2,184	2,304	2,211
Total	38,801	106	1,759	1,571	1,645	2,718	3,427	2,772	3,877	4,353	4,148	4,691	4,066	3,774
TAYLOR COUNTY—														
Old pools	30,356	83	2,585	3,065	3,034	2,915	2,542	2,654	2,579	2,399	2,098	2,430	2,124	1,931
Bowles	55,909	153	11,848	5,770	7,647	5,295	5,076	4,442	3,704	3,005	2,718	2,043	2,219	2,142
South View	30,967	92	.....	879	1,908	1,805	1,321	1,004	1,512	2,335	2,588	6,287	5,967	5,561
Lake Kirby	1,793	12	.....	.....	.....	.....	.....	.....	.....	377	386	351	343	336
Total	119,025	325	14,433	9,514	12,589	10,015	8,939	8,100	7,795	8,116	7,790	11,111	10,653	9,970
THROCKMORTON COUNTY—														
Miscellaneous	100,684	275	7,813	8,172	9,421	8,976	9,262	8,499	8,078	8,160	7,494	8,460	8,265	8,084
Total district	10,434,434	28,509	941,241	925,031	986,624	965,079	903,874	817,869	811,325	795,898	812,505	892,143	823,723	759,122
Daily average	28,509	.....	30,363	31,898	31,827	32,169	29,157	27,262	26,172	25,674	27,084	28,779	27,457	24,488

shallow Cisco series sands and will not develop into large fields. Several of the past year's strikes, will, however, undoubtedly develop into important fields during the new year.

In Taylor County, just outside the town of View and just south of the View gas field, oil was discovered in a saturated Cisco sand from 2,329-95 ft. late in January and as the year closed there were four producers in the field and a total proven area of some 500 acres. With a reserve now established at a million and a half barrels, continued development during the year will no doubt add more proven acreage.

Another shallow discovery which will have steady development during the year is the Reid field in Jones County which was opened in April from the Gunsight lime by John E. Farrell 1 F. D. Reid, NW Section 31, Deaf & Dumb Asylum Lands Survey. The discovery well was completed for 150 bbl. daily and opened a new producing stratum for the county, the nearest Gunsight lime production being farther northeast in Young and Jack counties. Six producers had been completed by the close of 1940 and a like number of tests were either drilling or preparing to start. The area has been confined only by one deep failure which was also a failure in the shallow Gunsight lime.

Deep Stribling Level

Late in August a new and deeper producing level was opened in the Caddo lime producing Stribling field in Stephens County. Horwitz & Oldom, Wichita Falls, drilled 4 Maury, J. Koehler Survey, in the approximate center of the field, into saturation in the Mississippian lime from 4,588 to 4,694 ft. and completed it for 1,182 bbl. daily. The well had been a failure in the regular level of the field, finding the Caddo abnormally low in the center of the field. As the year closed another well was added in the deep level, but the majority of the drilling in the field will probably be to the regular Caddo level during the coming year. The entire field is fairly well defined on all sides and will not see a great deal of drilling.

Palo Pinto Lime Play Unprofitable

Ever since the opening of the Ivy field in northwest Shackelford County 3 years ago a considerable amount of wildcatting in West Central Texas has been directed toward the Palo Pinto lime. Closely following the opening of this field efforts were rewarded with the discovery of the Avoca field and the Griffin field in Jones County. Since these three fields have been completely drilled, wildcatting continues throughout Jones, Haskell and Shackelford counties in search of another Palo Pinto lime field. It is estimated that some 25 wildcats have been abandoned as dry during the year after seeking Palo Pinto lime production in these three counties alone. The only favorable results during the past year have been the opening of a small and none too prolific spot on the Jones and Haskell county line and another small spot just north of the Avoca field. The former was opened in February by K. B. Nowles 1 Pardue, Section 1, S.F.I.W. Survey just over the county line in southern Haskell County. It was completed for 30 bbl. daily, pumping, with a great deal of water. The second attempt for the area extended the field south a mile and into Jones County; however, the well was not a great deal different from the discovery. The third well was much the same. In the meantime the original discovery was abandoned as noncommercial and the field remained at the close of the year with three completions but only two commercial wells.

About 1½ miles north of production in the original Avoca field King Oil Co. opened a small Palo Pinto lime producing spot in September when its 1 Olson, NE cor. Section 189, B.B.B.&C. Survey, was completed for 263 bbl. in 8 hours from saturation at 3,217-37 ft. By the close of the year an additional producer, an offset, and an offset dry hole had been completed in the field. It was indicated, however, that drilling would continue in search of the field's trend during the new year.

The majority of the shallow Cisco sand areas had not developed past the two or three-well stage at the close of the year, and if 1940's discoveries in the area are a criterion, many of them will never develop past this stage. Some, however, will develop into small 10 or 20-well shallow fields. These little-publicized 10 and 20-well fields are what continue to attract the independent operator to West Central Texas.

NORTH CENTRAL TEXAS

Completions by Counties for 1940

County—	Comp.	Prod.	Dry	Gas
Archer	514	278,935	92	0
Baylor	26	8,195	11	0
Brown	50	227	30	0
Callahan	89	358	71	4
Clay	237	31,879	134	1
Coleman	50	7,200	11	6
Comanche	25	357	15	1
Concho	2	0	2	0
Cooke	187	36,017	43	0
Coryell	4	0	4	0
Denton	4	26	3	0
Eastland	23	1,599	13	1
Erath	4	15	3	0
Fisher	2	5	1	0
Foard	8	756	1	1
Grayson	3	0	3	0
Hardeman	2	0	2	0
Haskell	6	35	5	0
Hood	1	0	1	0
Jack	90	18,608	35	0
Jones	157	25,476	49	1
Montague	104	73,753	34	0
Nolan	2	9	1	0
Palo Pinto	16	37	9	4
Parker	2	0	2	0
Runnels	4	640	1	0
San Saba	2	0	2	0
Shackelford	186	9,591	84	7
Stephens	23	7,030	8	0
Tarrant	2	0	2	0
Taylor	25	3,555	14	1
Throckmorton	8	101	5	1
Wichita	514	195,520	119	0
Wilbarger	97	27,953	30	0
Wise	3	0	3	0
Young	283	70,758	113	9
Total 1940	2,755	798,635	956	37
Total 1939	2,526	788,391	979	42
Difference	229	10,244	23	5

Completions by Months

Month—	Comp.	Prod.	Dry	Gas
January	244	86,953	79	7
February	218	60,360	73	4
March	257	79,712	99	4
April	293	94,491	105	3
May	255	96,672	98	0
June	223	64,915	64	3
July	285	64,226	108	2
August	124	30,627	40	2
September	187	53,827	65	3
October	289	73,292	102	3
November	219	57,834	69	3
December	161	35,726	54	3
Total 1940	2,755	798,635	956	37
Total 1939	2,526	788,391	979	42
Difference	229	10,244	23	5

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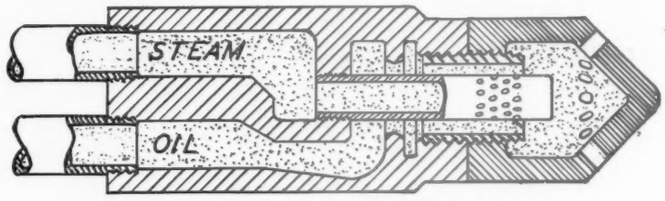

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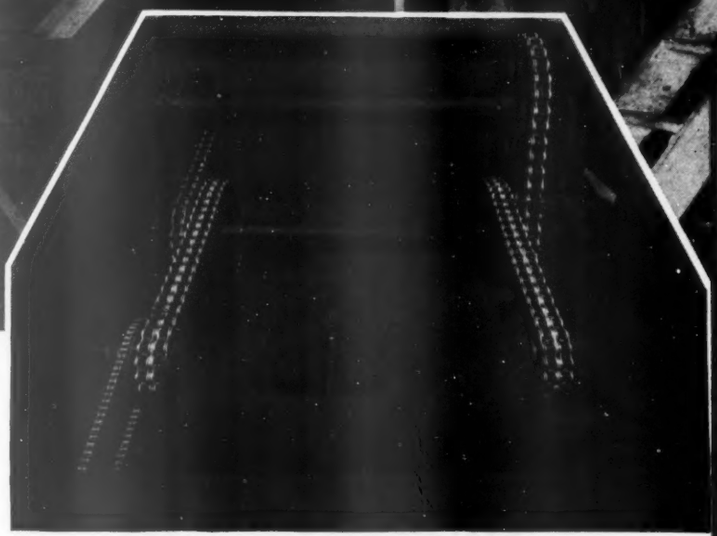

Showing interior of Model CT-5 draw works, including drive to oil pump, high speed drum drive, rotary and low speed drum drive . . . all Link-Belt Silverlink roller chains and sprockets.

● A growing demand for mechanical type rigs for 6,000′ drilling has resulted in a material set-up in production of Portable Rig Co.'s Model CT-5, the fully enclosed five-speed unit which has won world-wide favor among operators for safe, dependable, long-life performance. The assembly line of CT-5's pictured above in Portable's plant is only a small part of this manufacturer's production program.

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Portable Rig Co. is one of the many well known rig manufacturers using Link-Belt Silverlink roller chains, of which there is a type, size and capacity to meet every requirement for rotary and cable tool rigs, clean-out machines, "spudders," truck mounted core drilling and geophysical units, chain driven pumping units, pipe line ditching machines, and numerous other important oil industry jobs.

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MIDWEST

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MIDWEST WELDING FITTINGS IMPROVE PIPING DESIGN AND REDUCE COSTS

DEEP DISCOVERIES FROM CROCKETT TO COCHRAN OPEN MANY FIELDS

By R. MARNE SANFORD

IN no other one year have so many major steps been taken toward exploring for and actually opening deep producing spots in the West Texas district. Far and above all other outstanding development for the past year in West Texas was the discovery of five new deep-producing areas and the launching of a full-scale deep drilling program for the entire Permian basin from Cochran County on the north to Crockett County on the south.

The first major deep discovery of the year was the Todd deep field in northern Crockett County. Opened the first of April, production was found from a heretofore little-productive stratum in the district, the crinoidal zone of the Strawn series of Pennsylvanian age. Some Pennsylvanian production was discovered years ago in the Big Lake field of Reagan County; however, none farther west. With a full 100 ft. of saturation drilled in the Todd deep-field discovery well, Continental 2 Todd, S½ Section 29, Block WX, G.C.& S.F. Survey, was completed for 840 bbl. in 12½ hours or for a daily rating in excess of 1,600 bbl. As the year closed there were six completions in the field.

Tubb Field

The next major deep field for the district was opened in May by Gulf Oil Corp. on its extensive holding on the Tubb ranch in Crane County. The discovery was in the Ellenburger lime of Ordovician age and is called the Southeast Sand Hills deep field. The field is located on the southern edge of the Sand Hills Permian field and just southeast of the original Sand Hills deep field which also produces from the Ellenburger lime and is located on the western edge of production in the Sand Hills Permian field. Although only about 2 miles separate the two deep fields, they are believed to be on separate highs since there are intervening failures at the deep levels. The discovery well was Gulf 1-A Tubb, Section 20, Block 27-B, P.S.L. Survey, and by the close of the year two additional producers had been drilled in the area, both for only slight extensions.

One of the most important discoveries of the year in the district was made in mid-November when Taubert-McKee-Siemoneit 1 Crockett, Section 4½, Block 3, H.&T.C. Survey, came in for a daily rating of 1,900 bbl. from the Simpson lime of upper Ordovician in northern Pecos County. Located in a long-explored prospective deep-producing area where one costly failure had been drilled by Magnolia and Tex-Mex Oil the year previous, this strike set off the now-spreading deep search throughout the entire district. Many short-term leases in the area called for immediate drilling, but as the year closed only the discovery well had been completed in the area. However, Magnolia, Phillips, Tex-Mex Oil and the discovery firm planned immediate drilling. Considerable oil was found in the old 1-A McKee failure just north of the discovery well which thus may not limit the field.

Early in December Gulf Oil Corp. completed another major deep strike for the district when 5 Wristen Brothers, just ½ mile south of the Shipley field in Ward County, established a daily rating of 3,049 bbl. from an altogether new horizon for the entire State of Texas, the Silurian. Originally drilled to a total depth of 9,187 ft. in the Ordovician, the well was plugged back and acidized heavily in the Fusselman lime zone of Silurian age from 7,018-60 ft. This discovery indicated the possibility that many of the lower Permian lime failures throughout the southern part of the basin could be deepened into possible production from this Silurian level. As the year closed, new tests were starting in the vicinity of the discovery well and several failures throughout the area were being considered for deepening.

Wasson Deep Pay

Late in the last month of the year the northern part of the basin was greatly augmented by the discovery of a deep and prolific level some 1,500 ft. below regular production in the large Wasson field in Gaines County. Opened by the original discoverer of the Wasson field, the strike was Amon G. Carter 5-D Wasson, Section 50, Block AX, P.S.L. Survey, just south of the Yoakum County line. It was completed for a daily rating of about 750 bbl., based on a 7-hour flow of 230 bbl. after 18,500 gal. of acid from 6,210-6,894 ft.

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DISCOVERIES IN WEST TEXAS DURING 1940

County, discovery well, location—	Date	Depth	Gage	Formation	No. wells	Name pool	Remarks
Crockett, Stanolind 4 Todd, Sec. 30, Blk. WX, G.C.&S.F. Sur.	Jan. 8	1,220-25	180 bbl.	Upper Permian lime	2	Wyatt	May prove link with Apco field.
Pecos, Olson Drilling Co. et al 1 Crockett, 2 mi. SW Apco field	Feb. 10	4,479-4,518	286 bbl. in 2½ hr.	Ellenburger of Ord.	1	.....	
Crockett, Continental 2 Todd, S½ Sec. 29, Blk. WX, G.C.&S.F. Sur.	April 1	5,590-5,690	840 bbl. in 12½ hr.	Strawn L. of Penn.	6	Todd Deep	
Crockett, Soma Oil & Gas 1 Noelke, 5 mi. E Yates field	April 15	1,035-65	192 bbl. in 4 hr.	Yates sand	9 oil; 4 gas	Noelke	
Pecos, R. L. Walker 1 White & Baker, 5 mi. E of Taylor-Link field	April 29	1,991-2,016	19 bbl. in 24 hr.	Upper Permian lime	6	Walker	
Crane, Gulf 1-A Tubb, Sec. 20, Blk. 27-B, P.S.L. Sur.	May 1	5,760-83	5,121 bbl. in 24 hr.	Ellenburger of Ord.	3	SE Sand H. Ex.	
Tom Green, Bartlett C. Mann 1 Funk, SW SE Sec. 32, Blk. 5, H.&T.C. Sur.	May 27	1,150-68	61 bbl. day	Blaine L. of Permian	1	Funk	
Andrews, Atlantic Ref. et al 1 University, Blk. 11, University Sur.	June 12	4,350-4,475	168 bbl. day.	Big lime	3	Atlantic-Univ.	The third well for field was a 3-mi. S extension.
Crockett, Moore-Olson 1 W. T. Noelke, NW SE Sec. 10, Blk. GG	June 14	2,160-2,371	126 bbl. day.	Upper Permian	1	.....	
Crockett, Olson Drilling Co. 1 A. C. Hoover, Blk. 1, G.C.&S.F. Sur.	July 20	2,012-2,145	53 bbl. day.	Upper Permian	1	Hoover	
Ward, Kenneth Slack 1 Hayes, Sec. 148, Blk. 34, H.&T.C. Sur.	Aug. 22	5,043-5,160	40 bbl., 20,000,000 ft. gas	Delaware sand	1	Hayes Gas	First indicated discovery in Apr. but officially gaged in Aug.
Winkler, Gulf 136 O'Brien, 1½ mi. SE Halley field	Sept. 9	2,729-2,970	8½ bbl. oil, 1¾ bbl. wtr.	Big lime	3	Halley S Ex.	Will probably prove part of Halley field in future.
Andrews, Phillips 1 Embar, NW NW Sec. 5, Blk. 44, Twp. 2n, T.&P. Sur.	Sept. 30	4,240-4,335	3,000,000 cu. ft. gas	Permian, San Andres	1	Embar	Completed for fuel source for other wells now drilling.
Ector, Forest Dev. Co. 1 Bradley, Sec. 18, Blk. 43, Twp. 3s, T.&P. Sur.	Oct. 21	4,230-4,362	102 bbl.	Big lime	1	Duro	¾ mi. W offset dry. 1½-mi. S outpost now drilling.
Pecos, Taubert, McKee & Siemoneit 1 Crockett, Blk. 3, H.&T.C. Sur.	Nov. 18	5,270-5,357	933½ bbl. in 11⅝ hr.	Simpson of Up. Ord.	1	Abell	
Ward, Atlantic Refg. 1 Wickett-University, Sec. 12, Blk. 16, Univ. Sur.	Nov. 22	2,892-2,920	452 bbl. oil, 1,540 bbl. w.	Middle Permian	3	S. Mag.-Sealy	First indicated discovery in May.
Pecos, M. D. O'Quinn 1 O'Neil, Sec. 74, Blk. 10, H.&G.N. Sur.	Nov. 26	1,607-35	23 bbl.	Upper Permian	1	O'Neil	
Ward, Gulf 5 Wristen Bros., ½ mi. S of Shipley field	Dec. 10	7,018-60	3,049 bbl.	Fusselman of Silurian	1	Shipley Deep	
Gaines, Amon G. Carter 5-D Wasson, in original Wasson field	Dec. 24	6,210-6,894	230 bbl. in 7 hr.	Lower Permian	1	Wasson Deep	Deep level for Wasson field.

DISCOVERIES IN SOUTHEAST NEW MEXICO DURING 1940

County, discovery well, location—	Date	Depth	Gage	Formation	No. wells	Name pool	Remarks
Chaves, H. E. Yates 1 Johnson, NE NW 24-15-28, 2½ mi. N of Eddy County line	Feb. 13	1,456-1,500	800,000 cu. ft. gas	Sand	1	Johnson	Completed after being P.B. from 3,285 ft., T.D.
Eddy, Neil Willis 1 F. G. Keyes, NE SW 15-20-30	June 15	1,587-1,600	200 bbl.	Sand	2	Keyes	
Eddy, Martin Yates, Jr. 1 E. L. McCall, SW SW SW 24-18-26	July 21	4,022-32	96 bbl.	Sand	5	Dayton	
Eddy, J. B. Mulcock 1 Etz, SW SW 25-16-30	Oct. 28	2,553-3,082	2,400,000 cu. ft. gas	Sand	1	.....	
Eddy, Thomas-Bowers 1 Etz, SW SW NW 13-16-30	Nov. 4	3,200	10 bbl., pumping	Lime	1	.....	Is located ¾ mi. NW of gas well completed in 1930 from 3,847.
Eddy, Willis & Abell 1 Hale, SW SE SW 12-20-30, 2 mi. NE of Willis field	Dec. 12	1,540-53	5,000,000 cu. ft. gas	Lime	1	Hale	

DISCOVERIES IN TEXAS PANHANDLE DURING 1940

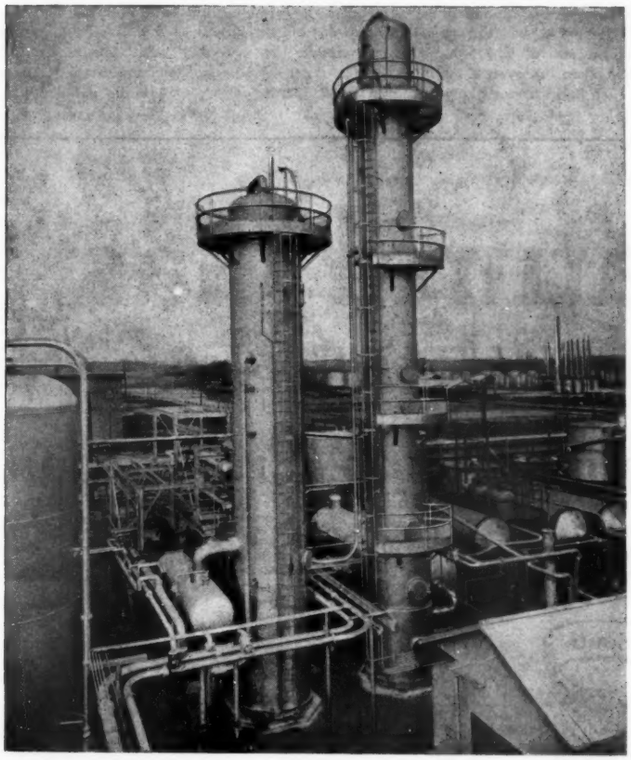
County, discovery well, location—	Date	Depth	Gage	Formation	No. wells	Name pool	Remarks
Sherman, I. T. I. O. 1-A Bryant, Sec. 369, Blk. 1-T, T.&N.O. Sur.	Sept. 2	2,868-3,343	33,000,000 cu. ft. gas	Lime	1	Bryant	No further development yet started.

WEST TEXAS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
BIG LAKE DIST.—														
Big Lake	2,134,152	5,831	188,951	178,441	189,058	181,293	184,728	170,278	184,581	177,260	173,705	179,445	167,100	159,312
Crockett	96,934	265	10,080	9,602	10,287	9,534	8,657	7,383	7,571	7,040	6,677	6,899	6,663	6,541
Grayson	30,509	83	2,675	2,948	2,892	2,476	2,621	2,396	2,688	2,093	2,907	2,432	2,069	2,312
Todd	26,335	86	.....	.....	350	1,513	2,181	2,052	2,485	2,546	3,192	4,308	3,922	3,786
World	409,294	1,118	34,619	34,137	38,326	36,263	34,532	30,076	27,767	23,538	27,876	36,579	44,457	41,124
Wyatt	5,331	16	.....	398	677	756	679	495	448	406	403	377	365	327
Total	2,702,555	7,384	236,325	225,526	241,590	231,835	233,398	212,680	225,540	212,883	214,760	230,040	224,576	213,402
CHURCH-FIELDS DISTRICT—														
Church-Fields	1,713,297	4,681	147,580	142,604	158,453	148,796	133,978	105,011	94,400	112,627	189,688	194,825	147,075	138,260
Gulf-McElroy	3,029,469	8,277	165,947	269,404	301,625	295,753	289,579	222,855	204,834	263,013	282,943	304,598	234,803	194,115
McClintic	353,265	965	31,210	30,094	39,305	36,851	35,341	26,395	23,219	27,786	29,589	30,492	22,666	20,317
Total	5,096,031	13,924	344,737	442,102	499,383	481,400	458,898	354,261	322,453	403,426	502,220	529,915	404,544	352,692
COWDEN DISTRICT—														
Cowden, North	3,568,410	9,750	309,157	294,754	320,993	391,664	372,865	299,211	277,882	256,925	251,793	270,442	264,605	258,119
Cowden, South	292,544	799	13,729	13,276	13,654	15,181	18,549	17,418	16,711	28,428	35,540	44,209	39,465	36,384
Emma	247,177	675	28,586	19,860	22,389	20,975	20,466	22,332	19,207	18,457	17,768	19,012	19,248	18,877
Johnson	213,004	582	4,694	7,067	8,651	9,588	15,280	17,815	15,459	18,391	23,715	28,999	31,154	32,191
Foster	3,462,760	9,461	336,835	291,493	349,792	351,675	340,251	274,849	256,298	225,286	254,610	266,326	260,733	254,612
Total	7,783,895	21,295	693,001	626,450	715,479	789,083	767,411	631,625	585,557	547,487	583,426	628,988	615,205	600,183
DEEP ROCK DISTRICT—														
Deep Rock	48,812	133	4,781	5,124	5,500	5,070	4,439	3,978	3,449	3,292	3,088	3,552	3,353	3,186
Fuhrman	517,293	1,413	48,667	45,112	48,194	44,839	41,598	45,513	40,852	37,530	35,710	37,330	43,521	48,427
Parker	10,994	30	698	972	1,023	885	990	965	912	975	848	877	919	930
Walker	11,965	33	.....	.....	.....	460	536	976	1,226	1,060	1,267	1,940	2,180	2,320
Total	589,064	1,609	54,146	51,208	54,717	51,254	47,563	51,432	46,439	42,857	40,913	43,699	49,973	54,863
WASSON DISTRICT—														
Waples-Platter	14,756	40	901	1,449	1,551	1,449	1,350	1,028	914	828	1,478	1,175	1,338	1,295
Wasson	11,038,421	30,160	783,919	884,327	1,129,597	986,654	992,237	896,268	844,206	798,835	892,354	962,403	946,236	921,385
West	10,438	29	650	1,070	1,140	764	883	760	659	1,159	764	975	828	786
Total	11,063,615	30,228	785,470	886,846	1,132,288	988,867	994,470	898,056	845,779	800,822	894,596	964,553	948,402	923,466
GOLDSMITH DISTRICT—														
Goldsmith	7,909,510	21,611	701,278	561,837	830,240	799,380	757,942	588,272	535,387	654,793	687,616	709,230	535,674	547,861
Harper	1,235,380	3,375	113,620	101,466	117,813	137,926	131,959	103,052	97,387	88,731	85,825	86,472	84,213	86,916
Goldsmith, North	11,954	781	.....	.....	.....	.....	.....	.....	.....	1,295	2,049	3,047	2,731	2,832
Total	9,156,844	25,019	814,898	663,303	948,053	937,306	889,901	691,324	632,774	744,819	775,490	798,749	622,618	637,609
HENDRICKS DISTRICT—														
Eaves	122,131	334	8,712	7,771	8,078	6,659	5,816	11,150	11,127	10,402	11,462	14,138	13,168	13,648
Emperor	513,293	1,402	43,986	49,395	55,866	53,211	53,930	38,638	35,547	31,682	37,118	45,590	33,710	34,620
Hailey	97,867	267	9,584	8,473	8,954	8,303	8,246	6,173	8,615	8,053	7,695	8,172	7,837	7,762
Henderson	1,047,704	2,863	73,481	79,329	84,568	78,693	75,012	82,483	73,101	67,340	63,904	86,320	143,262	140,211
Hendricks	2,943,775	8,043	255,313	231,620	253,866	244,110	249,897	240,261	246,832	248,922	250,988	248,548	238,442	234,976
Kermit	3,178,290	8,684	328,656	290,829	303,234	281,779	327,198	274,020	254,071	237,599	222,640	225,843	218,795	213,626
Keystone	1,667,596	4,556	132,773	112,028	177,463	168,104	158,496	122,216	121,913	142,025	139,308	149,087	117,755	126,428
Leck	165,273	452	13,564	9,547	10,760	13,203	18,597	15,401	14,689	13,011	12,643	13,208	15,338	15,312
Scarborough	540,936	1,478	41,045	58,914	62,348	57,970	54,921	42,454	39,688	37,191	35,977	36,320	36,806	37,302
Total	10,276,865	28,079	907,114	847,906	965,137	912,032	952,113	832,796	805,583	796,225	781,735	827,226	825,113	823,885
HOWARD-GLASSCOCK—														
Carter	6,604	18	749	652	775	207	605	493	527	527	581	510	476	502
Chalk-Settles	4,962,171	13,576	466,743	437,427	469,062	443,586	430,510	347,844	386,643	383,274	401,122	412,207	396,912	386,841
Total	4,968,775	13,576	467,592	438,079	469,837	443,793	431,115	348,337	387,170	383,801	401,703	412,717	397,388	387,343
IATAN DISTRICT—														
Iatan	1,703,506	4,654	163,874	148,475	157,604	147,312	151,308	131,903	142,263	136,432	132,956	135,334	127,926	128,119
Snyder	497,925	1,360	60,342	49,218	47,310	43,846	42,811	35,124	38,354	36,776	39,048	37,868	32,882	34,346
Total	2,201,431	6,015	224,216	197,693	204,914	191,158	194,119	167,027	180,617	173,208	172,004	173,202	160,808	162,465
McCAMEY DISTRICT—														
Herrington	11,935	33	596	1,203	1,428	1,176	1,198	1,169	1,010	840	964	729	788	834
Hurdle	30,065	82	2,749	2,708	2,775	2,596	2,585	2,197	2,342	2,407	2,555	2,467	2,298	2,386
McCamey	3,990,132	10,902	340,203	367,075	389,664	367,693	378,911	311,414	279,346	263,088	335,148	374,439	295,390	287,761
Cowden-Crane	311,921	852	28,211	30,575	29,326	28,618	27,495	24,571	23,890	23,409	23,972	25,107	22,820	23,927
Webb-Ray	8,787	24	666	936	627	1,089	795	580	766	693	649	717	629	640
Total	4,352,840	11,893	372,425	402,497	423,820	401,172	410,984	339,931	307,354	290,437	363,288	403,459	321,925	315,548
PECOS VALLEY DISTRICT—														
Apco	42,180	115	4,673	3,299	3,763	4,721	4,063	3,408	2,228	2,517	2,325	3,043	3,876	4,264
Fromme	27,349	75	1,061	1,550	2,211	2,448	2,890	2,314	2,245	2,048	1,892	3,290	2,762	2,638
Lehr	132,183	361	8,689	9,048	10,398	11,648	11,557	9,960	9,451	13,521	12,762	12,748	11,455	10,966
Masterson	65,529	179	6,489	5,074	5,929	5,314	5,433	4,625	4,219	3,947	6,223	6,927	5,828	5,521
Nettleville	41,103	112	3,656	3,847	3,851	3,470	3,761	3,566	3,593	3,060	3,230	2,887	2,999	3,183
Payton	676,754	1,849	89,694	71,535	72,160	65,788	62,171	52,932	48,780	44,517	41,274	44,763	42,268	40,872
Pecos Valley	499,930	1,366	37,680	32,287	46,391	44,119	43,482	38,011	36,405	36,567	42,934	65,768	37,970	38,316
Richards	643	2	150	220	165	108	.....	.....	.....	.....	.....	.....	.....	.....
Shearer	298,735	816	43,598	22,167	23,514	21,722	19,999	22,399	18,814	15,862	26,056	32,060	26,647	25,897
Total	1,784,406	4,875	195,690	149,027	168,382	159,338	153,356	137,215	125,735	122,039	136,696	171,486	133,805	131,637
PENNWELL DISTRICT—														
Jordan	1,278,409	3,493	99,394	77,139	128,643	119,776	121,217	98,405	91,022	87,660	110,047	121,665	113,629	109,812
Pennwell	1,127,244	3,080	106,624	97,758	122,006	114,084	106,571	81,625	75,029	88,956	93,236	97,825	74,689	68,841
Total	2,405,653	6,573	206,018	174,897	250,649	233,860	227,788	180,030	166,051	176,616	203,283	219,490	188,318	178,653
SLAUGHTER DISTRICT—														
Dean	18,407	50	1,800	1,652	2,471	1,901	1,568	1,648	1,572	1,470	1,344	1,090	924	967
Duggan	229,320	627	23,348	15,417	29,771	22,890	18,839	17,115	16,907	13,063	19,028	16,964	17,661	18,317
Slaughter	934,411	2,553	82,204	59,256	94,080	31,744	71,253	68,582	66,043	74,997	88,548	87,789	81,650	78,265
Total	1,182,138	3,230	107,352	76,325	126,322	106,535	91,660	87,345	84,522	89,530	108,920	105,843	100,235	97,549
WADDELL DISTRICT—														
Dime	124,734	341	15,391	12,148	13,492	12,619	12,376	9,715	9,161	7,983	7,937	8,439	7,689	7,784
Edwards	2,114	6	154	177	183	200	196	186	167	201	142	150	176	182
Waddell	615,376	1,681	51,436	32,609	68,300	64,926	59,921	48,050	43,106	49,926	54,809	56,757	42,417	43,119
Ella Waddell	3,192	26	.....	.....	.....	.....	.....	.....	.....	.....	616	1,050	600	926
Total	745,416	2,037	66,981	44,934	81,875	77,745	72,493	57,951	52,434	58,110	63,504	66,396	50,882	52,011
WARD, N., DISTRICT—														
Magnolia-Sealy	228,217	624	18,778	15,583	22,987	23,175	23,284	17,276	19,277	18,270	17,405	18,187	17,438	16,557
Ward, North	2,126,189	5,809	194,144	177,519	221,012	212,120	200,968	151,031	139,187	171,166	179,280	187,565	143,075	149,122
Magnolia-Sealy, South	6,198	25	.....	.....	.....	.....	500	607	586	546	750	1,852	627	730
Total	2,360,604	6,450	212,922	193,102	243,999	235,295	224,752	168,914	159,050	189,982	197,435	207,604	161,140	166,409
WARD, S., DISTRICT—														
Dobbs	2,050	6	107	152	89	264	168	107	210	225	175	126	215	212
Estes	2,480,989	6,779	207,884	176,067	260,401	257,150	241,575	188,819	172,371	206,444	209,253	218,745	168,660	173,620
Shipley	475,009	1,298	34,193	48,050	52,151	47,829	47,997	37,922	34,669	32,935	31,710	41,273	33,861	32,419
Ward, South	1,704,659	4,658	158,381	133,525	173,196	159,117	159,141	141,518	135,710	137,381	134,985	138,192	123,901	109,612
Total	4,662,707	12,740	400,565	357,794	485,837	464,360	448,881	368,366	342,960	376,985	376,123	398,336	326,637	315,863
YATES DISTRICT—														
Soma-Noelke	15,634	64	.....	.....	.....	.....	4,000	.....	480	440	420	2,250	3,682	4,362
Tobarg	566,248	1,547	49,119	47,655	51,167	48,102	51,474	47,287	47,167	46,045	44,564	46,603	44,231	42,834
White & Baker	58,904	161	4,572	4,361	5,558	4,851	4,696	3,939	4,918	4,673	4,650	5,965	5,559	5,162
Yates	6,956,084	19,006	644,466	537,620	772,074	723,651	671,490	516,549	457,589	420,454	527,569	551,735	560,771	572,116
Total	7,596,870	20,756	698,157	589,636	828,799	776,604	731,660	567,775	510,154	471,612	577,203	606,553	614,243	624,474
OTHER FIELDS—														
Mason	78,863	215	9,736	7,476	8,454	7,379	6,970	6,045	5,427	5,785	5,496	5,569	5,212	5,314
Means	827,884	2,262	76,591	73,758	80,980	77,538	75,076	57,728	52,522	48,544	69,839	73,278	71,168	70,862
N'west-Sharon Ridge	277,418	621	17,461	19,064	17,374	22,164	23,230	24,480	23,264	26,738	27,230	26,838	25,264	24,311
Sand Hills	785,307	2,146	54,750	53,003	71,167	73,974	69,030	55,982	53,644	46,017	77,318	89,770	68,466	72,186
Seminole	988,315	2,700	27,995	32,718	39,288	44,482	82,556	75,710	79,407	82,258	128,257	144,739	119,587	131,312
Taylor-Link	617,183	1,686	52,785	50,922	54,329	51,358	51,066	50,332	47,789	52,486	51,737	52,454	51,028	50,897
Westbrook	261,433	714	17,574	21,674	22,708	22,704	24,084	22,883	22,035	22,334	21,377	21,766	20,827	21,462
Wheat	396,174	1,082	32,779	30,526	32,265	29,050	33,863	28,686	31,282	34,337	34,010	36,683	35,297	37,396
Miscellaneous	109,249	.....	6,441	6,160	6,474	8,686	8,294	9,153	9,706	8,136	9,005	9,479	13,847	14,868
Total West Texas	83,271,535	.....	7,083,621	6,662,626	8,174,220	7,818,972	7,704,731	6,425,075	6,105,248	6,207,474	6,817,568	7,248,832	6,556,508	6,466,660
Daily average	227,518	.....	228,504	229,746	263,685	260,632	248,540	214,169	196,943	200,241	227,252	233,833	218,550	208,602

FOR
GASOLINE REFINING

SOLUTIZER
PROCESS



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1. Lead response greatly improved; clear octane number often raised . . . Straight run, cracked and reformed gasolines rendered doctor sweet by simple extraction.

2. Enhances anti-knock value of gasolines—raises marginal gasolines to octane number specification without exceeding lead limits . . . Pays out in remarkably short time.

3. Three plants in commercial operation processing 35,000 barrels per day . . . In course of construction by Foster Wheeler Corporation—28,000 barrels per day Solutizer units engineered and constructed by Foster Wheeler under patents of the Shell Development Company.

FOSTER WHEELER CORPORATION, 165 BROADWAY, NEW YORK, N. Y.

FOSTER WHEELER

The discovery was drilled in the highest part, structurally, of the original Wasson field, and was the follow-up test of the same operator's 4-D Wasson, which found the zone several weeks earlier but passed it up to continue towards its 10,000-ft. contract depth. The 4-D Wasson, just north of the deep discovery and in the same section, is still drilling below 9,000-ft. and has since been reconstructed to 11,000 ft., which will be the deepest test yet drilled in the north-basin area. The deep discovery is virtually surrounded by producers in the regular Wasson producing level and almost all drilling to the deep horizon will have to be by twinning present producers.

Southern Basin Permian Discoveries

Crockett County was given its greatest play early in the year following the discovery of the Noelke area just across the Pecos River from the famous Yates field in Pecos County. The entire western part of the county immediately became active. The Moore-Olson field and the Hoover field were discovered. Both are shallow fields of one well each and are not likely to see a great deal of development. The Noelke field has grown to nine oil wells and four gas wells and is due to advance steadily during the new year.

In Ward and Winkler counties wildcatting during the summer and early fall resulted in the opening of the South Halley field and the South Magnolia-Sealy field, both of which will probably prove at a later date to be a part of the main fields from which their respective names were obtained. The South Magnolia-Sealy field, although discovered by a little-acclaimed and comparatively unimportant initial well, is steadily growing by subsequent development into a prolific producing area. Opened by Atlantic Refining Co. 1 Wickett-University, Section 12, Block 3, University Survey, which first showed for a producer early in May, the discovery was completed for 452 bbl. of oil and 1,540 bbl. of water daily. The second completed well extended the area a mile to the north and made a flow of 646 bbl. in 20 hours, considerably higher, structurally, than the discovery well. Apparently locating the top of the structure ½ mile farther north, the third well for the area came in as a large gas producer some 21 ft. higher, structurally, than the 1-mile-north extension.

The South Halley field, discovered early in September between the Halley and the O'Brien fields in Winkler County, is rapidly proving to be a south-extension area to the Halley field and possibly a link area between that field and O'Brien. Discovered by Gulf 136 O'Brien, C S line Section 11, Block F, G.&M.B.&A. Survey, the well made only 8½ bbl. of oil and 1¾ bbl. of water on official gage from 2,729-2,970 ft. Extending the area ½ mile east, the company completed its second attempt for 259 bbl. daily through open casing from 2,874 ft., considerably higher, structurally, than the discovery.

Large Fields Linked

Probably the greatest oil reserve added in West Texas in one year since the linking of the Wasson and the Bennett field in Yoakum County in 1939 was the definite joining of the Slaughter field in Hockley County with the Duggan field in Cochran County last year. During the summer of 1940 Texas Co. and Magnolia Petroleum Co. took the lead in drilling the necessary link wells which led to the declaration by the Texas Railroad Commission in August that both fields were producing from a common structure. The joining of the two fields added some 32,500 acres to the combined proven areas and established a field even larger than Wasson in actual acreage. Very little local structure is known to be present in the area, production being mainly dependent upon saturation and porosity, and for this reason the field may be extended considerably upstructure to the north.

SOUTHEAST NEW MEXICO

Three oil discoveries and three gas discoveries during the past year in Southeast New Mexico marked one of the most profitable 12-month periods in several years. Probably the most important of the new discoveries is the Dayton field, on the northwest edge of Lake McMillan in north-central Eddy County. The discovery well was Martin Yates, Jr. 1 E. L. McCall, SW SW SW 24-18-26, completed for 200 bbl. daily from sand drilled from 1,587-1,600 ft. Located on a local structural high, the area has already proven for production some 640 acres with five completed wells.

Adding the greatest oil reserve and accounting for two of the area's discoveries, one oil and one gas, the High Lonesome district of extreme northern Eddy County experienced a great deal of exploratory drilling during the past year. The High Lonesome field itself was increased by some 2,500 acres of proven or semiproven area while there was an oil discovery in 13-16-30 and a gas discovery in 25-16-30. The gas area was opened by J. B. Mulcock 1 Etz and was completed for 2,400,000 cu. ft. daily from a section of sand drilled from 2,553-3,082 ft. The shallow oil discovery was Thomas-Bowers 1 Etz, and was completed for 10 bbl. daily, pumping, from lime at 1,744 ft.

Proven-Field Development

For another year the greatest amount of proven-field development was in the Loco Hills field of Eddy County. Extension activity continued during the entire year, the majority being concentrated on the southeast end of the field. A total of some 3,000 acres of proven area were added to the field during the past year, establishing an added reserve of about 12,000,000 bbl. Other fields which experienced extension activity and had new productive acres added during the year were West and South Eunice and North and South Maljamar, all in Lea County, and the Artesia field in Eddy County.

TEXAS PANHANDLE

Remoteness from markets has worked out to the advantage of operators in the Texas Panhandle by permitting a slow and steady development of the area. As a result, the Panhandle's fifteenth year of oil and gas production was also its fifth highest in terms of oil production and its second best year in dollar value of its products.

Several important tests were drilled, including Amarillo Oil Co.'s well on the outskirts of the city of Amarillo which found a good showing of high-gravity oil. Hutchinson County production was extended north in the dolomite zone by several miles and the Teci pool, in the Osborne area of Wheeler County, was also extended by ½ mile.

(Continued on Page 129)

Natural Gas

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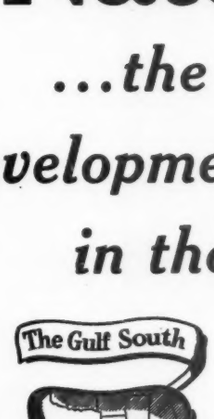

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UNITED GAS PIPE LINE COMPANY

Gas development was steady with the outstanding feature the I. T. I. O. discovery in Sherman County which adds another county to the great Panhandle gas field and brings the connection between the Panhandle and Hugoton closer by several miles. Whether the two fields eventually unite may be settled by exploratory drilling during the coming year.

Field Developments in 1940

West Texas

District and field—	No. wells Jan. 1	No. wells Dec. 31
Big Lake:		
Big Lake	202	209
Crockett	27	27
Grayson	5	5
Todd	0	5
World	46	50
Wyatt	0	2
Church-Fields:		
Church-Fields	335	336
Gulf-McElroy	94	131
McClintic	64	65
Cowden:		
N. Cowden	327	414
S. Cowden	21	70
Emma	27	37
Johnson	8	55
Foster	392	509
Deep Rock:		
Deep Rock	10	10
Fuhrman	54	55
Parker	2	2
Walker	0	2
Wasson:		
Waples Platter	1	2
Wasson	673	1,032
West	1	1
Goldsmith:		
Goldsmith	769	902
Harper	187	184
N. Goldsmith	0	5
Hendricks:		
Eaves	7	7
Emperor	90	98
Halley	24	26
Henderson	137	139
Hendricks	309	334
Kermit	831	861
Keystone	215	240
Leck	9	9
Scarborough	132	133
Howard-Glasscock:		
Chalk-Settles	836	856
Carter	2	1
Iatan:		
Iatan	268	279
Snyder	91	94
McCamey:		
Herrington	2	2
Hurdle	15	14
McCamey	870	874
Cowden-Crane	110	116
Webb-Ray	4	4
Pecos Valley:		
Apco	3	8
Fromme	4	9
Lehn	15	36
Masterson	22	24
Netterville	20	22
Payton	132	143
Pecos Valley	162	185
Richards	2	2
Shearer	38	43
Penwell:		
Jordan	132	189
Penwell	172	174
Slaughter:		
Dean	1	3
Slaughter-Duggan	65	144
Waddell:		
Dune	16	10
Edwards	1	1
Ella Waddell	0	1
Waddell	57	67
N. Ward:		
Magnolia-Sealy	40	54
S. Magnolia-Sealy	0	2
N. Ward	316	353
S. Ward:		
Dobbs	1	1
Estes	320	342
Shipley	105	113
S. Ward	692	665
Yates:		
Soma-Noelke	0	3
Tobarg	216	231
White & Baker	7	14
Yates	576	568
Other fields:		
Mason	9	10
Means	101	118
Sharon Ridge	63	95
Sand Hills	72	94
Seminole	30	160
Taylor Link	84	92
Westbrook	92	96
Wheat	84	91
Total	10,876	12,407

Miscellaneous Fields

Field—	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Anthony	676	2	1	1
Cedar Lake	46,635	127	5	11
Garza	3,247	9	3	3
Irion	5,072	14	9	9
Grassroots	657	55	0	1
Monroe	6,296	17	2	2
Moore	16,384	45	6	6
Opp	730	12	1	0
Page	12,643	35	1	2
Bolt	529	2	0	1
Funk	300	10	0	0
Huddleston	6,055	29	0	2
West Andrews	4,314	24	0	3
Abell	5,712	94	0	1

New Mexico

Lea:	No. wells Jan. 1, 1940	No. wells Dec. 1, 1940
Arrowhead	90	92
Cooper	94	87
Eaves	20	19
Eunice	492	489
Halfway	2	6
Hardy	107	120
Hobbs	248	248
Langlie	125	124
Lynch	11	11
Jal	24	20
Lynn	26	27
Mattix	136	150
Monument	493	493
Penrose	168	186
Skelly	59	72
S. Eunice	100	73
S. Lovington	33	34
Vacuum	270	328
West Eunice	5	9
Artesia area:		
Artesia	159	157
Grayburg-Jackson	125	216
Leonard	23	45
Loco Hills	70	142
Maljamar	31	85
Red Lakes	12	21
Robinson	9	13
Shugart	13	23
Barber	1	3
NW New Mexico:		
Aztec	16	16
Hogback	7	10
Rattlesnake	34	36
Table Mesa	7	7
Total	3,034	3,396

Miscellaneous Fields

Lea County—	Production	Daily average	No. of wells Jan. 1 1940	No. of wells Dec. 31, 1940
Corbin	8,310	23	1	2
North Lynch	9,414	26	2	1
Rhodes	56,791	155	7	10
Skaggs	24,453	67	3	3
Artesia area—				
Dayton	4,727	38	0	7
High Lonesome	8,480	23	2	6
N. Maljamar	577	3	0	1
S. Maljamar	4,679	26	0	1

Texas Panhandle

	No. wells Jan. 1, 1940	No. wells Dec. 31, 1940
Carson County	515	615
Gray County	1,987	2,103
Hutchinson County	1,454	1,615
Moore County	20	16
Osborne area	25	30
Wheeler County	336	342
Total	4,337	4,721

WEST TEXAS DISTRICT

Completions by Months

Month—	Comp.	Prod.	Dry	Gas
January	186	155,064	11	0
February	150	131,595	10	0
March	169	146,637	10	2
April	204	164,325	13	0
May	147	120,117	9	1
June	166	136,391	8	2
July	178	146,503	9	1
August	142	120,184	7	1
September	126	104,691	13	0
October	156	119,969	11	3
November	119	85,705	4	1
December	112	98,665	14	0
Total 1940	1,855	1,529,846	119	11
Total 1939	1,870	1,464,169	163	4
Difference	15	65,677	44	7

SOUTHEAST NEW MEXICO DISTRICT

Completions by Counties for 1940

County—	Comp.	Prod.	Dry	Gas
Chaves	11	20	9	0
Eddy	248	49,989	69	8
Lea	321	114,661	18	8
Luna	2	0	2	0
Total 1940	582	164,670	98	16
Total 1939	580	250,841	55	15
Difference	2	86,171	43	1

Completions by Months

January	79	24,606	16	2
February	58	19,657	6	2
March	52	18,451	5	4
April	75	19,688	11	1
May	40	15,716	7	1
June	56	14,328	10	1
July	53	10,517	8	1
August	32	8,997	8	0
September	33	6,616	11	0
October	50	10,851	9	2
November	27	7,357	4	1
December	27	7,886	3	1
Total 1940	582	164,670	98	16
Total 1939	580	250,841	55	15
Difference	2	86,171	43	1

TEXAS PANHANDLE DISTRICT

January	44	13,262	0	7
February	49	13,972	4	4
March	33	8,369	1	6
April	54	15,328	1	12
May	55	12,434	1	6
June	42	8,341	3	6
July	72	14,851	1	10
August	55	9,443	1	11
September	36	5,702	2	7
October	55	9,902	5	7
November	25	4,528	2	3
December	40	6,720	3	2
Total 1940	560	122,912	24	81
Total 1939	442	116,068	33	81
Difference	118	6,844	9	0

NEW MEXICO CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

LEA COUNTY—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Arrowhead	915,836	2,502	Inc. in S. Eunice		82,833	80,539	82,063	86,755	95,108	95,334	92,113	102,614	98,315	100,162
Cooper	1,151,150	3,145	102,794	102,150	110,661	98,245	105,158	91,754	97,116	92,023	85,832	90,886	86,599	87,932
Eaves	252,931	691	24,292	21,795	22,509	22,862	23,625	20,075	23,869	20,134	17,127	18,740	18,747	19,156
Eunice	6,560,819	17,926	598,933	576,054	612,167	569,344	570,130	536,744	554,477	522,752	509,602	530,338	482,817	497,461
Halfway	67,627	184		3,695	6,737	5,436	5,184	4,752	5,405	6,563	6,204	8,671	7,838	7,142
Hardy	1,098,863	3,002	97,919	98,400	103,905	93,342	92,102	89,962	91,393	94,604	87,514	84,872	80,913	83,937
Hobbs	3,784,875	10,341	368,654	399,125	350,234	310,048	318,184	303,174	322,319	316,580	272,045	280,299	269,610	274,603
Langlie	1,587,538	4,338	149,586	138,136	150,793	141,588	133,436	126,044	130,017	133,902	118,221	129,036	118,041	118,738
Lynch	154,744	423	15,097	16,160	14,843	12,708	12,450	12,126	10,396	12,663	10,564	12,725	12,854	12,158
Lynn	299,566	818	22,743	26,246	26,436	24,439	24,898	24,793	25,239	24,219	22,914	24,191	26,208	27,240
Mattix	1,687,141	4,610	141,855	148,287	160,524	144,234	146,244	144,549	143,984	140,002	124,077	131,094	128,030	134,261
Monument	6,887,042	18,817	607,987	604,658	657,984	602,685	586,295	566,260	570,918	557,327	529,667	556,024	518,661	528,576
Penrose	1,602,756	4,379	138,478	148,710	138,213	137,145	137,870	130,820	128,799	134,667	126,369	129,972	122,276	129,437
Skelly	593,895	1,623	48,133	50,461	50,603	48,362	47,149	50,844	49,844	52,981	46,757	49,769	46,681	52,311
South Eunice	938,688	2,565	125,811	121,023	67,783	64,758	67,111	68,566	73,744	70,805	71,859	68,064	67,602	71,562
West Eunice	90,216	246	6,248	5,933	5,804	6,956	7,574	7,191	7,575	8,879	7,793	8,722	8,355	9,186
South Lovington	477,505	1,305	39,451	36,188	50,279	46,784	38,613	40,317	40,955	38,685	35,474	37,611	36,116	37,032
Vacuum	4,737,657	12,944	482,529	432,840	406,132	390,699	392,547	384,803	378,978	378,098	374,360	392,227	363,148	361,296
Jal	163,793	448	16,154	15,223	15,066	14,476	14,200	13,890	14,111	12,889	13,488	12,340	10,084	11,572
Miscellaneous	100,366	274	6,587	5,153	7,421	8,316	8,413	7,221	7,656	8,429	7,204	9,647	12,108	12,211
Total	33,153,008	90,582	2,993,251	2,950,237	3,040,927	2,822,966	2,813,246	2,710,340	2,771,903	2,721,536	2,559,184	2,678,142	2,515,003	2,575,973
ARTESIA AREA—														
Artesia	158,055	432	13,450	12,977	13,396	13,510	13,051	13,159	12,792	13,226	11,503	12,474	14,341	14,176
Grayburg-Jackson	1,772,757	4,844	150,370	133,711	139,676	130,290	174,065	138,536	147,635	152,564	147,695	154,395	150,540	153,280
Leonard	298,273	815	20,075	22,740	20,301	20,654	31,744	24,325	27,063	25,594	25,234	25,087	28,240	27,216
Loco Hills	1,959,251	5,353	142,885	148,980	175,804	160,836	187,457	159,965	163,717	162,780	163,698	172,386	159,426	161,317
Maljamar	755,324	2,064	41,441	43,856	54,377	55,670	65,441	54,537	63,781	68,503	70,505	74,922	78,005	84,286
Red Lakes	100,580	275	9,345	8,975	8,177	7,796	10,819	7,637	6,817	8,251	6,209	7,585	9,285	9,684
Robinson	89,884	246	7,394	8,875	8,125	8,078	9,393	7,761	7,601	6,825	6,511	5,984	5,991	7,346
Shugart	169,801	464	13,879	15,345	13,450	12,157	16,120	10,033	12,129	13,759	15,532	15,491	15,595	16,311
Barber	21,688	101		1,445					5,303	708	4,447	5,208	1,497	3,080
Miscellaneous	24,128		266	476	585	1,323	1,457	1,494	1,828	1,966	2,087	3,366	3,330	5,950
Total	5,349,741	14,617	399,105	397,380	433,891	410,314	509,547	417,447	448,666	454,176	453,421	476,898	466,250	482,646
Total New Mex.	38,756,797	105,892	3,413,675	3,371,688	3,493,879	3,251,712	3,342,013	3,158,642	3,241,863	3,198,358	3,031,215	3,173,438	3,000,799	3,079,515
Daily average	105,892		110,118	116,266	112,706	108,409	107,807	105,288	104,479	103,173	101,042	102,333	100,027	99,399

PANHANDLE CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

County—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Carson	3,231,303	8,829	268,493	216,788	295,863	282,574	274,846	223,235	259,509	248,640	326,191	339,991	259,541	235,632
Gray	12,005,623	32,802	1,051,869	1,096,143	1,211,590	1,068,073	1,012,524	799,248	919,558	864,388	1,129,151	1,167,575	881,385	804,119
Hutchinson	8,815,777	24,806	758,446	764,576	821,772	779,583	752,151	598,693	683,333	649,135	843,224	867,260	674,843	622,761
Moore	248,936	680	24,503	26,568	30,080	26,367	23,499	17,674	17,000	15,216	19,565	18,336	15,809	14,319
Wheeler	1,669,403	4,561	234,793	142,991	150,112	140,700	136,114	107,566	126,377	119,663	145,041	145,960	115,274	104,812
Osborn	138,575	379	9,619	12,593	12,731	12,848	12,547	11,693	11,328	10,922	11,726	12,192	10,500	9,876
Total	1,807,978	4,940	244,412	155,584	162,843	153,548	148,661	119,259	137,705	130,585	156,767	158,152	125,774	114,688
Total Panhandle	26,109,617	71,338	2,347,723	2,259,659	2,522,148	2,310,145	2,211,681	1,758,109	2,017,105	1,907,964	2,474,898	2,551,314	1,957,352	1,791,519
Daily average	71,338		75,733	77,919	81,368	77,005	71,345	58,604	65,068	61,547	82,397	82,300	65,251	57,803

DEVONIAN PRODUCTION DECLINE NOT BALANCED BY DISCOVERIES

By HARRY F. SIMONS

DURING 1940 Illinois hit its highest productive level and started downward during the most hectic 12 months of the state's petroleum history. Repeatedly during the first 6 months, the state's "all-time high in production" mark was broken until a peak of 518,000 bbl. daily was reached during the last week in June. From that time to the close of the year the production in the state gradually declined to a daily average of 326,000 bbl. Total production for the year was 146,450,876 bbl., a daily average of 400,130 bbl. The new fields produced a daily average of 390,531 bbl., while the old fields produced 9,608 bbl. daily.

The year opened with the state reaching for more market in which to dispose of its uncontrolled production; at the same time the development of the Devonian production in the Salem field got under way. Pipe-line capacity, production and market increased as the year went on with all three reaching their peak as the Devonian development in Centralia kicked the total daily production figure of the state upward. At the end of the year, the Devonian production had declined and forced the state's total output downward, but the market and pipe-line facilities remain. Small refineries which had been attracted to the state by plenty of flush oil were either forced to shut down or to curtail their runs drastically.

Illinois finds itself at the start of the new year with a market and transportation facilities far beyond its capacity to produce. It also enjoys a sellers market as buyers are competing for the crude output. In addition to main-line expansion of Sohio, Illinois and Texas-Empire pipe lines, there has been substantial increase in the gathering facilities and major purchasers, par-

DISCOVERIES IN ILLINOIS DURING 1940

County and field—	Company and farm—	Location—	Total depth	Producing formation— Depth to top in feet	Name	Initial prod. (bbl.)	Date of completion of discovery well
Cole, Mattoon	Carter 1 J. Seaman	SE NE SW 35-12n-7e	2,027	2,002	McClosky sand	121	6-40-40
Edwards, Albion	Noah & Morrison 1 Barnes	SE NE NE 24-2s-10e	3,240	3,130	McClosky sand	132	3-26-40
Gallatin, Inman	Colbeck et al 1 Duffey	NE NW NW 25-8s-9e	3,007	2,803	Rosiclare ss.	7½	4-9-40
Hamilton, Dale	Kingwood 1 Wilson	NW NW SE 6-6s-7e	2,695	2,662	Cypress	115	3-26-40
Jasper, Boos	Pure Oil 1 Warren Consolidated	C E½ NE NW 33-6n-10e	2,847	2,822	McClosky sand	348	3-19-40
Jasper, West Liberty	Pure Oil Co. 1 M. Aldridge	C E½ NE NW 17-5n-10e	2,850	2,790	McClosky sand	1,422	6-4-40
Wabash, Lancaster	Riddle et al 1 Seibert	NE NE NE 4-1n-13w	2,743	2,686	McClosky sand	500	4-2-40
Wabash, Maud	Lambert 1 Sieler	SE SE SE 27-1s-13w	2,626	2,615	McClosky sand	192	6-18-40
Wabash, Mt. Carmel	Delta Drilling Co. 1 Utter	SE SE NE 17-1s-12w	2,050	2,014	Cypress ss.	19	1-30-40
White, Burnt Prairie	Bishop, Harrington, Busch 1 Griffin	SE SE SW 28-3s-9e	3,505	3,445	McClosky sand	103	1-23-40
White, Centerville	Sun 1 C. Brown	C S½ SE NW 2-4s-9e	3,375	3,341	Ste. Genevieve ls.	631	5-28-40
White, Iron	J. W. Carter et al 1 O. Johnson	SW NW NE 25-6s-8e	2,528	2,485	Hardinsburg ss.	635	2-6-40
Washington, Irvington	Gulf Refining Co. 1 Buhl	C NW SE SW 23-1s-1w	1,538	1,519	Bethel ss.	683	7-2-40
Wayne	Lessing Aich 1 Conrad Dickey	C S½ SE NE 3-1s-6e	3,300	3,172	McClosky sand	10	6-18-40
Clinton, Centralia	Ames 2 Hicks	SW NE SE 12-1n-1w	4,068	4,018	Trenton ls.	120	7-2-40
Washington, Irvington	Gulf 1 Buhl	C NW SE SW 23-1s-1w	1,538	1,519	Bethel sandstone	583	7-2-40
White, Roland	Kingwood 1 Martin	NW SW NE 13-7s-8e	2,248	2,244	Tar Springs sandstone	36	7-2-40
Jasper, North Boos	Pure 1 Bergbower	C E½ NE SE 16-6n-10e	2,882	2,800	McClosky sand	200	7-9-40
Hamilton, Hoodville	Kingwood 1 Morris	SW SE NE 34-5s-6e	3,200	3,189	McClosky sand	150	7-16-40
White, N. New Harmony	Superior 2 Fitten	NE NE NE 27-4s-14w	2,296	2,225	Tar Springs sandstone	90	7-16-40
Montgomery, Waggoner	Randall 1 Street	SW SW NE 31-11n-5w	625	611	Pennsylvanian ss.	28	7-30-40
Bond, Woburn	National Ref. 1 Spindler	NW NW NW 10-6n-2w	1,021	1,009	Bethel sandstone	209	8-13-40
Jasper, Hidalgo	Johnson O. & R. 1 Mendenhall	SW SW SE 17-8n-10e	2,607	2,536	McClosky sand	175	9-4-40
White, Herald	Carter 1 Dagley	NW NW NE 11-7s-9e	1,516	1,502	Pennsylvanian ss.	55	9-4-40
Jasper, North Boos	Conner & Arnold 1 Swick	SE SE NE 17-6n-10e	2,820	2,780	McClosky sand	746	9-10-40
Clinton, West Centralia	Sistler 1 Phoenix	NW NW SW 14-1n-1w	1,415	1,408	Bethel sandstone	25	10-1-40
Franklin, Thompsonville	Manley Oil Co. 1 Downen	SW SW SW 26-7s-4e	3,118	3,102	McClosky sand	800	10-1-40
White, Phillipstown	Neff 1 Garner	SW SW SW 36-4s-10e	2,971	2,953	Aux Vases	168	10-1-40
Gallatin, Inman	Colbeck 1 Egyptian T. & T.	SW NW NE 19-8s-10e	2,742	2,730	McClosky sand	200	10-8-40
Marion, Tonti	Texas Co. 1 Chance	NW NW SW 4-2n-2e	2,235	2.154	McClosky sand	24	10-15-40
Hamilton, Belle Prairie	Kingwood 1 Williams	S½ SE NE 3-4s-6e	3,470	3,467	McClosky sand	50	11-19-40
Effingham, Mason	Kilpatrick 1 Mason Comm.	NE SE NW 22-6n-5e	2,503	2,491	McClosky sand	376	11-30-40
Washington, McKinley	DeKalb et al 3 Hundleth	SW NE NW 29-3s-4w	1,186	982	Bethel ss.	165	12-17-40
White, Carmi	Mazda & Palmer 1 L. Storms	N½ SW SE 26-5s-9e	3,167	3,148	McClosky sand	65+	12-10-40
Gallatin, Omaha	Carter 1 York	SE SE SW 33-7s-8e	2,840	1,672	Palestine ss.	275	12-10-40
Jefferson, Woodlawn Extension—	Oberling & Phillips 1 Howe	NE NE SW 25-2s-1e	1,990	1,974	Bethel ss.	60	12-10-40
White, Storms ext.	Bates & Lichlyter 1 Aud	NE NE SW 27-6s-9e	2,764	2.328	Waltersburg ss.	3	1-16-40

ILLINOIS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
BOND COUNTY—														
Sorrento	2,536	7	310	174	248	240	310	300	248	248	210	248	.....	.....
Woburn	94,319	629	.....	.....	.....	.....	.....	.....	.....	713	23,219	25,670	22,800	21,917
Total	96,855	636	310	174	248	240	310	300	248	961	23,429	25,918	22,800	21,917
CLAY COUNTY—														
Clay City	3,866,190	10,563	534,533	451,965	445,515	390,113	381,024	318,930	286,967	263,655	218,550	205,282	187,500	182,156
Flora	75,434	206	7,094	8,269	7,737	6,214	7,43?	6,990	6,014	5,549	4,680	5,301	5,040	5,115
Iola	3,360	9	248	.....	217	240	496	420	527	279	210	248	240	235
Flora (East)	19,753	54	1,392	1,327	1,280	1,216	1,239	2,210	1,736	2,170	1,620	1,798	1,800	1,965
Total	3,964,737	10,832	543,267	461,561	454,749	397,783	390,190	328,550	295,244	271,653	225,060	212,629	194,580	189,471
CLINTON COUNTY—														
Centralia	10,641,870	29,076	159,791	195,775	490,592	771,638	1,183,079	2,953,650	1,962,021	864,993	603,480	550,591	471,330	434,930
Hoffman	112,920	309	479	129	559	3,124	4,300	6,660	13,113	19,778	19,140	18,414	14,700	12,524
Bartelso (deep)	209,700	573	5,429	18,105	11,296	11,816	22,953	26,319	27,450	24,641	18,929	17,231	13,841	11,690
Bartelso (old)	167,060	456	5,828	7,163	7,409	9,210	14,136	14,186	17,864	19,340	17,942	19,160	16,898	17,924
Total	11,131,550	30,414	171,527	221,172	509,856	795,788	1,224,468	3,000,815	2,020,448	928,752	659,491	605,396	516,769	477,068
COLES COUNTY—														
Mattoon	7,274	39	.....	.....	.....	.....	.....	.....	1,767	1,140	1,116	964	1,140	1,147
EDWARDS COUNTY—														
Albion	1,095,450	3,983	.....	.....	.....	8,290	35,963	50,970	78,554	101,184	158,040	275,342	201,510	185,597
Cowling	52,549	144	3,562	7,975	5,425	5,250	4,836	4,200	2,139	4,402	3,780	4,154	3,540	3,286
Grayville	65,870	180	16,030	6,384	7,770	7,011	3,828	4,110	3,782	3,968	3,540	3,441	3,030	2,976
Total	1,213,869	3,316	19,592	14,359	13,195	20,551	44,627	59,280	84,475	109,554	165,360	282,937	208,080	191,859
EFFINGHAM COUNTY—														
Mason	3,685	60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,925	1,760
FAYETTE COUNTY—														
Louden	26,595,650	72,666	2,202,274	2,153,891	2,319,925	2,151,372	2,319,403	2,179,410	2,293,752	2,303,300	2,184,360	2,191,297	2,115,630	2,181,036
St. James	1,713,141	4,681	73,679	66,736	90,091	102,704	116,106	162,030	174,964	183,365	188,160	195,331	181,260	178,715
Total	28,308,791	77,347	2,275,953	2,220,627	2,410,016	2,254,076	2,435,509	2,341,440	2,468,716	2,486,665	2,372,520	2,386,628	2,296,890	2,359,751
FRANKLIN COUNTY—														
Thompsonville	79,266	1,299	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34,440	44,826
Whittington	7,043	19	477	499	942	685	705	720	713	465	480	465	450	442
Total	86,309	236	477	499	942	685	705	720	713	465	480	465	34,890	45,268
GALLATIN COUNTY—														
Inman	3,518	10	.....	638	620	150	248	270	248	496	330	305	93	120
Junction	103,324	282	8,060	8,526	7,657	6,450	6,510	6,600	7,037	7,250	8,704	12,307	11,730	12,493
Omaha	11,798	193	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,413	10,385
Total	118,640	324	8,060	9,164	8,277	6,600	6,758	6,870	7,285	7,746	9,034	12,612	13,236	22,998

(Continued on Page 133)

ROLL CALL FOR 1940

1114 Miles of Pipe Lines ELECTRIC WELDED by H.C. PRICE CO.

COMPANY	MILES	LOCATION	GENERAL CONTRACTOR
Panhandle Eastern Pipe Line Co.	70	Kansas	T. R. Jones, Inc.
Panhandle Eastern Pipe Line Co.	125	Missouri-Illinois	I. C. Little
Shell Pipe Line Co.	17	Illinois	I. C. Little
Sohio Pipe Line Co.	125	Illinois-Indiana	Sheehan Pipe Line Const. Co.
Sohio Pipe Line Co.	115	Indiana-Ohio	Truman-Smith Const. Co.
Magnolia Pipe Line Co.	2	Illinois	I. C. Little
Magnolia Pipe Line Co.	15	Illinois	Sheehan Pipe Line Const. Co.
Illinois Pipe Line Co.	97	Illinois	Sheehan Pipe Line Const. Co.
Tuscarora Oil Co., Ltd.	27	Pennsylvania	Superior Const. Co.
Tuscarora Oil Co., Ltd.	10	Pennsylvania	Dempsey-Wilson Const. Co.
Gulf Pipe Line Co.	22	Illinois	Jones & Brooks, Inc.
Buckeye Pipe Line Co.	45	Ohio	Sheehan Pipe Line Const. Co.
Michigan Gas Transmission Corp.	57	Indiana	T. R. Jones, Inc.
United Gas Pipe Line Co.	3	Louisiana	Ford, Bacon & Davis Const. Co.
Montana-Dakota Utilities Co.	170	Montana	W. A. Bechtel Co.
Atlantic Refining Co.	8	Pennsylvania	Dempsey-Wilson Const. Co.
Natural Gas Pipeline Co. of America	100	Illinois	Dempsey-Wilson Const. Co.
Natural Gas Pipeline Co. of America	25	Illinois	I. C. Little
National Refining Co.	57	Kansas	Williams Brothers Corp.
Southern Natural Gas Company	24	Alabama	B & M Construction Co.
	1,114		

SPECIFY PRICE-WELDED FIELD JOINTS IN 1941

H.C. PRICE CO.

BARTLESVILLE, OKLA.

LOS ANGELES EFFINGHAM, ILL. SAN FRANCISCO

ticularly in the Wabash-White county area.

Activity at the start of the year as shown by weekly completions was 64 and at the end was 51. During the

Activity

year, the record high in completions was reached when over 100 tests were completed during the last week in May. During the same month there were over 600 active tests as compared to just over 400 at the start and less than 350 at the close of the year.

Discoveries during the year totaled 38, with the most important being those in the southwestern part of the state and those in the Central basin area. Activity along the Du Quoin anticline was concentrated mostly toward developing production in fields previously located, although several discoveries resulted from wildcatting in that area.

Deep Testing

There were a number of deep tests drilled during the year, outstanding being Pure Oil Co.'s penetration of the St. Peter sand in the Cisne field, Phillips' deep test in White County, Rossi's Trenton test in Salem, Ames' Trenton test in Centralia, Martin's Trenton test in Sandoval, and Carter's Devonian test in the Louden field. There were also numerous holes drilled to the deeper zones in other areas which resulted in failure.

With the exception of Rossi's Trenton test in Salem, none of these tests uncovered commercial production and the value of the Salem discovery is highly doubtful. Carter's Devonian venture was a stratigraphic test and the hole was plugged, the operators refusing to divulge what had been found. The Devonian at Louden thus remains a distinct possibility for production.

The other deep tests, because of their number and distribution, throw a pall over the outlook for deep development generally in the state. The Devonian lime has been productive only in the region influenced by the Du Quoin anticline; where tested elsewhere it has been a failure. With the exception of the old fields which are producing from the Trenton, the only oil obtained from that formation has been in the same region. The amount of oil found in the Trenton has been very small, although for a time the wells which did obtain production looked very favorable but later proved to be very small and short-lived producers.

While the Devonian at Centralia and Salem accounted for kicking the state's production to its record point, it is not considered to be a "good" producing formation. Due to its high porosity and permeability the initial production from the Devonian may be high, but the decline is extremely rapid. For a state which has no legal restrictions of any kind, this type of production leads to competitive drilling campaigns and high peaks of production during which the oil from the more stable formations is forced into the background. The effect on the price of the total output of such an area is obvious.

Field Developments in 1940

Illinois

Field—	No. wells Jan. 1, 1941	No. wells Jan. 1, 1940	Field—	No. wells Jan. 1, 1941	No. wells Jan. 1, 1940
Aden	150	66	Linn	5	0
Albion	58	0	Louden	1,745	1,369
Barnhill	72	44	Marcoe	2	1
Bartelso	63	2	Mason	2	0
Benton	1	0	Mattoon	1	0
Boos-W. Liberty	53	0	McKinley	1	0
Boyleston	88	26	Mill Shoals	53	27
Centerville	3	0	Mount Carmel	8	1
Calvin	142	1	New Harmony	90	0
Centralia	841	526	Noble-Dundas	332	233
Cisne	52	46	Olney	37	35
Clay City	404	358	Omaha	2	0
Cordes	129	95	Patoka	100	96
Cravat	12	9	Phillipstown	7	2
Dix	64	57	Ridgway	2	0
Dubois	5	2	Roaches	10	9
Enterprise	159	57	Roland	1	0
Fairman	16	9	St. James	169	88
Flora	18	16	Salem-Tonti	2,445	1,654
Grayville	7	7	Stewardson	3	1
Griffin	297	135	Stokes	12	10
Harold	3	0	Storms	127	25
Hidalgo	2	0	Thompsonville	18	0
Hoffman	44	1	Whittington	1	1
Hoodville	60	0	W. Enterprise	15	0
Ina	1	7	Woburn	23	0
Inman	2	0			
Iron	44	0	Total	8,077	5,036
Irvington	4	0			
Junction	14	8			
Lancaster	28	0			
Leech	30	10			

Many operators feel that with a lower price caused by the flush production, the higher costs due to the increased depths and the general overequipping of wells and the none-too-high ultimate recovery, the deeper production in the state may be an unsound investment. Until the situation can be stabilized by some type of conservation law or through unitization of a field, the deep production will not be particularly desirable.

A more optimistic picture is presented by the shallower formations, many of which are being developed in the fields located in the vicinity of the Wabash River. Numerous formations above the Cypress formation have been found to be productive and in some cases the sand thickness, porosity and permeability encourage anticipation of satisfactory ultimate recovery. Wells do not have the high initial of the Devonian or the McClosky lime, but in many cases will eventually produce more oil.

In addition to being more stable, the upper zones require a relatively small investment and the wildcatting in such areas can be carried on without excessive outlays. In most fields the plan has been to drill the discovery well to the McClosky or deeper (St. Louis or Devonian) and then plug back to the upper zones. Where deeper production is discovered, the lower horizon may be produced and subsequent wells drilled to the Chester (Mississippian) and the Pennsylvanian pay zones.

Discoveries

The effect of the Devonian production has already diminished, Salem's daily average for December being 117,375 bbl. from a peak of 267,116 bbl. daily for the month of March; Centralia has declined from 98,455 bbl. per day in June to 14,030 bbl. in December. Their decline has been particularly offset by the development of the new discoveries in the state, particularly in White, Wabash, Edwards, Hamilton and Franklin counties. This area was producing over 47,000 bbl. daily. Production from this area can be expected to increase for a time. Edwards County had one discovery to bring the total of producing fields in the county to three, Franklin County got a new field and now has two pools, Gallatin County had two new fields and an extension to its other field, Hamilton County got three new pools and broke into the producing column for the first time. Wabash County had three discoveries and now has six fields, White County led the parade with eight new

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pools and one extension and was producing from 13 pools at the end of the year. Along with the discoveries and extensions was the discovery of new pays in many of the fields.

In White County recent activity has been directed toward developing the Mill Shoals, Calvin, New Harmony and Storms fields with the new Carmi field (a discovery of December) to be developed if later wells in that area are better than the discovery. Principal activity is in the Calvin field where wells are being drilled to the Bethel, Stray, Weiler, Aux Vases sands and McClosky lime. Many of these wells are being completed as multizone producers. This field recently received an extension to the northward when a well making 138 bbl. was completed in the Weiler at 2,550 ft. The extension is in 28-3s-14w, while the main body of the pool is in 32 and 33-3s-14w and 8, 9, 16 and 17-4s-14w. Average initial production of wells in the field is 200 bbls.

The Mills Shoals field produces from both the McClosky and the Aux Vases sand but it is the latter which has received the bulk of recent development. The Aux Vases sand occurs at about 3,210 ft. with the wells averaging about 140 bbl. each. In the Storms pool the production is from the Waltersburg sand at about 2,240 ft.; recent development there has resulted mostly in small wells.

The New Harmony pool, in 22, 23, 27, 33 and 34-4s-14w and 4 and 7-5s-14w, produces from the Tar Springs, Waltersburg, Weiler, Bethel, Aux Vases, Rosiclare and McClosky. The field was extended during December by a 130-bbl. Aux Vases well in 7-5s-14w. Average in-

(Continued on Page 139)

ILLINOIS CRUDE-OIL PRODUCTION—(Continued)

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
HAMILTON COUNTY—														
Dale	314,186	1,027	.....	.....	1,678	1,672	2,939	63,600	43,958	47,864	41,400	38,688	36,210	36,177
Hoodville	352,760	1,648	.....	.....	.....	.....	.....	300	930	9,114	18,600	53,723	105,390	164,703
Belle Prairie	2,731	45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,470	1,261
Total	669,677	2,188	.....	.....	1,678	1,672	2,939	63,900	44,888	56,978	60,000	92,411	143,070	202,141
JASPER COUNTY—														
Boos	45,267	148	.....	.....	1,424	3,293	5,066	4,980	5,394	4,433	4,320	3,782	5,290	7,285
Hidalgo	5,439	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,247	630	562
North Boos	249,262	1,355	.....	.....	.....	.....	.....	.....	899	248	14,070	58,001	76,410	99,634
West Liberty	268,309	1,254	.....	.....	.....	.....	.....	6,840	18,042	20,367	40,020	44,144	49,740	89,156
Total	568,277	1,857	.....	.....	1,424	3,293	5,066	11,820	24,335	25,048	58,410	110,174	132,070	196,637
JEFFERSON COUNTY—														
Cravat	66,404	181	5,689	6,042	6,244	8,483	6,472	5,040	5,268	5,272	4,796	4,805	4,170	4,123
Dix	717,517	1,960	64,365	62,247	76,170	69,203	71,453	51,270	54,808	54,498	51,930	53,754	52,980	54,839
Ina	1,920	5	232	.....	236	235	233	240	248	248	.....	248	.....	.....
Marcoe	3,472	10	446	602	403	488	487	124	186	62	240	434	.....	.....
Roaches	174,664	477	10,941	11,426	15,402	20,907	23,521	17,940	17,360	15,593	13,080	10,788	9,150	8,556
Total	963,977	2,634	81,673	80,317	98,455	99,316	102,166	74,614	77,870	75,673	70,046	70,029	66,300	67,518
MARION COUNTY—														
Patoka	418,521	1,143	37,723	34,835	37,079	35,948	34,724	34,410	34,658	34,038	32,790	32,674	34,860	34,782
Salem	70,734,313	193,263	6,607,139	7,192,619	8,013,470	7,479,164	7,636,972	6,842,910	5,980,706	5,030,680	4,411,260	4,171,422	3,669,330	3,698,641
Sandoval	704,360	1,924	77,318	75,219	61,570	71,641	56,649	57,090	57,164	70,897	54,990	46,093	39,180	36,549
Tonti	2,556,475	6,985	236,154	253,386	313,578	205,602	196,122	180,570	273,358	250,449	208,661	173,259	142,080	123,256
Fairman	206,779	565	20,439	18,837	21,223	16,344	16,135	16,500	14,725	15,097	13,701	14,291	18,810	20,677
Total	74,620,448	203,881	6,978,773	7,574,896	8,446,920	7,808,699	7,940,602	7,131,480	6,360,611	5,401,161	4,721,402	4,437,739	3,904,260	3,913,905
MONTGOMERY COUNTY—														
Raymond	543	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	278	265
RICHLAND COUNTY—														
Dundas	2,027,408	5,539	165,632	144,710	166,528	124,825	231,184	191,640	167,555	166,532	184,419	168,795	157,860	157,728
Noble	1,963,294	5,364	118,767	126,950	163,078	166,030	178,440	179,124	177,506	174,933	166,590	171,120	167,280	173,476
Noble—North	718,693	1,963	70,290	66,734	67,517	67,249	67,796	60,609	61,070	58,776	52,740	49,507	47,580	48,825
Noble—South	61,981	169	5,134	5,811	4,577	7,200	5,788	5,040	5,270	5,053	4,860	4,836	4,320	4,092
Olney	210,335	575	24,946	18,128	15,026	14,972	20,660	16,830	17,825	16,244	15,748	18,259	16,290	15,407
Schnell	21,667	59	2,576	2,093	1,945	2,422	1,573	2,010	1,395	1,674	1,440	1,798	1,470	1,271
Total	5,003,378	13,670	387,345	364,426	418,671	382,698	505,441	455,252	430,621	423,212	425,797	414,315	394,800	400,799
SHELBY COUNTY—														
Stewardson	6,741	18	372	232	372	330	527	420	961	775	780	630	660	682
WABASH COUNTY—														
Griffin	1,194,068	3,262	26,924	26,487	38,790	46,961	125,996	84,660	89,776	91,140	94,710	246,636	175,110	146,878
Keensburg	1,614,881	4,412	160,712	149,615	182,732	187,244	186,225	194,460	96,906	100,440	100,830	96,906	82,830	75,981
Lancaster	343,648	1,123	.....	.....	3,999	7,920	45,170	55,110	48,081	47,864	43,710	39,370	28,740	23,684
Maud	46,995	307	.....	.....	.....	.....	.....	.....	.....	6,851	7,620	6,076	11,940	14,508
Mount Carmel	25,809	71	35	754	620	270	248	300	217	248	580	2,883	7,657	11,997
Linn	11,071	91	.....	.....	.....	.....	.....	.....	.....	.....	450	3,439	3,472	3,710
Total	3,236,472	8,843	187,671	176,856	226,141	242,395	357,639	334,530	234,980	246,543	247,900	395,310	309,749	276,758
WASHINGTON COUNTY—														
Cordes	714,065	1,951	56,208	66,271	65,775	65,312	61,915	56,610	62,217	62,372	56,250	59,427	51,240	50,468
Dubois	18,667	51	1,685	1,531	2,062	1,682	1,930	1,470	1,426	1,612	1,410	1,085	1,410	1,364
Irvington	509,458	2,769	.....	.....	.....	.....	.....	.....	47,492	90,489	91,350	97,123	90,810	92,194
Total	1,242,190	3,394	57,893	67,802	67,837	66,994	63,845	58,080	111,135	154,473	149,010	157,635	143,460	144,026
WAYNE COUNTY—														
Aden	100,670	292	5,581	5,146	9,274	5,228	5,358	5,190	10,168	11,687	10,860	11,067	10,726	10,385
Aden—North	908,338	2,481	72,738	67,300	68,476	70,056	69,867	67,020	74,679	86,149	78,360	83,855	83,100	86,738
Barnhill	646,375	1,766	73,673	59,553	60,499	56,440	50,121	43,770	46,655	49,538	52,650	56,389	48,510	48,577
Boyleston	1,305,780	3,568	33,023	37,062	41,961	48,500	63,295	105,540	206,646	202,740	176,940	144,553	128,464	117,056
Clay	478,752	1,308	58,280	55,097	54,062	47,294	45,527	38,370	38,316	37,138	28,890	26,815	24,690	24,273
Enterprise	2,951,424	8,064	107,092	123,704	134,291	142,653	141,359	189,450	287,370	325,159	348,810	380,680	377,280	393,576
Leech	127,817	349	10,688	7,921	15,202	13,867	10,783	13,050	11,129	12,121	9,660	8,029	7,710	7,657
Mount Erie	2,598	7	620	399	.....	412	372	210	248	217	120	.....	.....	.....
Rinard	645	4	.....	.....	.....	.....	.....	.....	.....	279	180	186	.....	.....
West Enterprise	104,413	567	.....	.....	.....	.....	.....	.....	6 293	5.332	12,660	21,929	28,470	29,729
Total	6,626,812	18,106	361,695	356,182	383,765	384,450	386,682	462,600	681,504	730,360	719,130	733,503	708,950	717,991
WHITE COUNTY—														
Burnt Prairie	143,639	429	.....	5,385	1,865	2,340	3,908	10,170	15,469	25,500	25,650	19,158	17,640	16,554
Calvin	590,615	1,614	1,095	754	620	750	1,271	9,120	22,351	16,218	28,050	107,136	159,936	243,314
Carmi	941	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	247	694
Centerville	48,835	265	.....	.....	.....	.....	.....	.....	8,893	13,051	7,860	7,347	6,011	5,673
Herald	3,414	22	.....	.....	.....	.....	.....	.....	.....	199	589	1,209	785	632
Iron	1,119,875	3,343	.....	22,678	53,639	155,045	125,258	113,121	103,943	113,369	124,216	117,521	96,872	94,213
Mill Shoals	571,341	1,561	44,969	40,403	43,578	44,803	45,858	42,930	40,830	41,633	48,030	55,273	59,820	63,214
New Harmony	653,260	1,950	.....	9,868	9,685	25,460	29,151	23,415	58,900	81,034	77,713	85,002	107,828	145,204
North New Harmony	259,161	1,408	.....	.....	.....	.....	.....	.....	1,149	6,045	19,587	43,499	86,520	102,361
Phillipstown	49,333	135	3,131	4,263	4,145	3,453	2,971	4,416	3,346	7,564	5,527	5,828	2,421	2,268
Stokes	107,175	293	19,910	13,584	10,550	10,550	10,654	7,050	6,940	5,983	6,420	5,216	5,357	4,961
Storms	1,514,168	4,137	33,748	65,688	99,981	75,819	100,625	138,510	174,871	177,130	166,839	179,488	152,231	149,238
Roland	2,395	11	.....	.....	.....	.....	.....	251	618	558	249	312	219	188
Total	5,064,152	13,836	102,853	162,623	224,063	318,220	319,696	348,983	437,310	488,284	510,730	626,989	695,887	828,514
Total new fields	142,934,377	390,531	11,177,461	11,710,890	13,266,609	12,783,790	13,787,170	14,679,655	13,283,111	11,409,443	10,419,695	10,566,284	9,789,794	10,060,475
Daily average	390,531	.....	360,563	403,824	427,955	426,126	444,747	489,322	428,487	368,047	347,323	340,848	326,326	324,531
OLD FIELDS:														
CLARK COUNTY—														
Casey	334,524	914	21,700	21,857	24,152	23,549	29,394	29,881	30,965	30,787	30,581	31,782	29,615	30,261
CRAWFORD COUNTY—														
Robinson	1,014,671	2,772	63,353	68,093	72,209	70,150	87,046	89,000	91,548	92,516	92,152	100,793	92,186	95,625
Stoy	222,577	559	17,824	17,723	15,125	15,589	20,558	17,783	20,169	20,068	20,648	21,318	16,238	19,534
Total	1,237,248	3,380	81,177	85,816	87,334	85,739	107,604	106,783	111,717	112,584	112,800	122,111	108,424	115,159
LAWRENCE COUNTY—														
Bridgeport	1,641,374	4,485	106,309	108,253	114,550	118,740	145,804	140,322	150,639	148,589	142,958	159,431	148,148	157,631
McDONOUGH COUNTY—														
Plymouth	121,535	332	9,415	9,990	10,577	11,014	11,306	9,478	10,638	10,729	9,070	10,019	9,081	10,218
ST. CLAIR COUNTY—														
Dupo	181,818	497	16,306	13,340	13,950	13,320	13,919	12,985	13,030	12,654	14,136	19,465	19,500	19,213
Total old fields	3,516,499	9,608	234,907	239,256	250,563	252,362	308,027	299,449	316,989	315,343	309,545	342,808	314,768	332,482
Daily average	9,608	.....	7,578	8,250	8,083	8,412	9,936	9,982	10,225	10,511	10,318	11,058	10,492	10,725
Total Illinois	146,450,876	400,139	11,412,368	11,950,146	13,517,172	13,036,152	14,095,197	14,979,104	13,600,100	11,724,786	10,729,240	10,909,092	10,104,562	10,392,957
Daily average	400,139	.....	368,141	412,074	436,038	434,538	454,684	499,303	438.713	378,219	357,641	351,906	336,819	335,257

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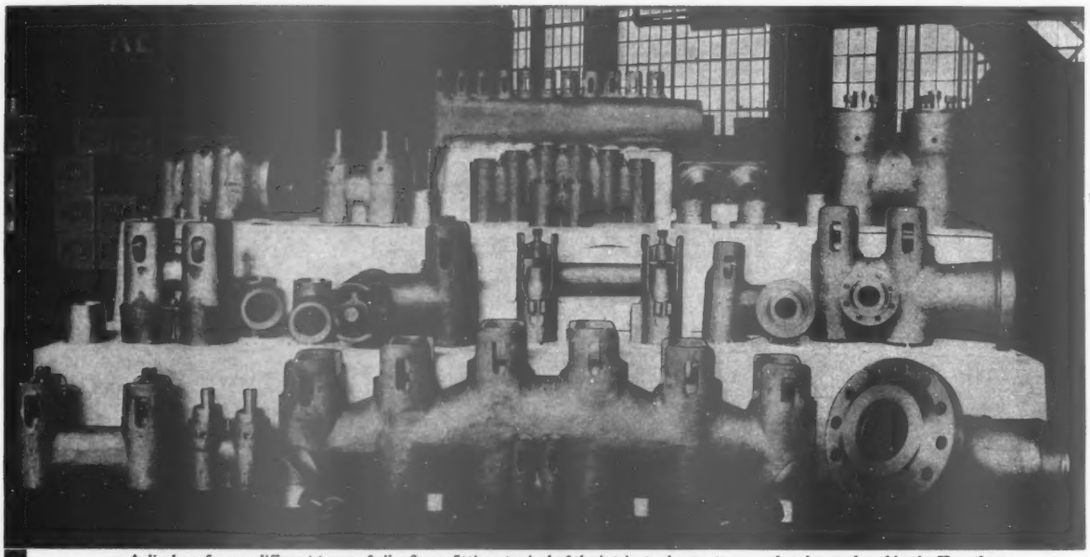

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IMPORTANT GAS EXTENSIONS FEATURE YEAR OF INSIDE DRILLING

By T. R. INGRAM

DRILLING operations in Wyoming in 1940 resulted in the completion of 179 wells, an increase of 29 over the preceding year, of which 47 were dry holes and 8 were gas wells. Lance Creek accounted for 62 of the completions and the La Barge district in Sublette County came second with 23, including some outlying wildcats. As a result of these operations approximately 1,740 acres were proven for oil, not counting extensions in gas fields, and approximately 16,920,000 bbl. was added to reserves.

There were two discoveries of new pools, the Cole Creek field Shannon sand horizon, in Natrona County, and a small pool 2 miles north of the La Barge field in Sublette County. Discoveries in deeper pays were made in the West Ferris, Lost Soldier and Mahoney Dome fields. Extensions of producing fields were made in the Sundance sand in Lance Creek and Rock River, in the Wasatch sand at La Barge, and in the Tensleep at Frannie. Extensions in gas fields included Big Sand Draw, Hiawatha and Muskrat.

Cole Creek

The most important discovery was in the Cole Creek field, northeast of Casper, in Natrona County, and between the Salt Creek and Big Muddy fields. In 1938 General Petroleum Corp. made a discovery in the Lakota sand in its 1 Government, NW NW SE 21-35n-77w. On the way down it had a good show of oil in the Shannon sand, but no test was made. This was followed by another deep test in its 1 State, NW NE SE 16-35n-77w, a mile to the north, which was a failure at 8,707 ft. and was plugged and abandoned. In May 1940 it started another deep test in 1-21-G, NW NW NW 21-35n-77w, which was of little value at 8,050 ft., total depth, in the Morrison. On the way down it also had a show in the Shannon. It was plugged back and completed in the Shannon sand at 4,525-62 ft. for an average of 350 bbl. a day on an 8-day pumping test. It was classed as a discovery in the Shannon sand and development then turned to that horizon. The discovery well in the Lakota also was plugged back and recompleted for 250 bbl. a day. Seven additional wells were completed in the Shannon in 1940. At the end of the year there were nine Shannon sand wells producing, extending from the NW SW SW 16-35n-77w to SE SW Section 22, a distance of 1½ miles on a northwest-southeast trend. Approximately 820 acres have been proven with a minimum of 8,200,000 bbl. in reserves. However, based on structural contours, it looks as if 1,000 acres at least will be productive. In the meantime the deeper pays are being held in reserve. A pipe line was built during the year from the field to the White Eagle refinery at Casper.

La Barge

The La Barge district in Sublette County, western Wyoming, was the second most active district in the state. In March, the North La Barge Oil Co. completed its 1 Government, SW NE SE 8-27n-113w, at 2,050 ft., total depth, in the Wasatch sand of Tertiary age, for 50 bbl. a day of 43-gravity oil. Top of the sand was at 2,012 ft. The location is 2 miles northwest of the nearest producer in the La Barge field and while at present it appears to be a new pool, it may prove to be an extension of the field on the southeast. Only one other well was drilled in the immediate vicinity, this being North La Barge Oil 2 Government, SE SW SE Section 8, ¼ mile to the

ROCKY MOUNTAIN CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

Montana

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Border	30,891	84	577	1,180	4,869	3,557	4,086	3,210	3,210	2,643	1,872	2,073	1,762	1,852
Cat Creek	181,792	497	14,738	15,008	16,119	15,722	14,859	14,790	15,432	15,843	15,779	14,085	14,685	14,732
Cut Bank	4,003,231	1,102	328,204	307,659	309,485	317,453	331,242	318,510	355,186	366,367	293,927	367,379	356,437	351,382
Dry Creek, etc.	246,381	673	21,261	17,267	22,746	21,907	23,382	22,400	24,628	27,001	30,293	16,288	6,589	12,619
Kevin-Sunburst	1,817,894	4,967	133,912	139,127	143,908	140,876	217,302	175,500	165,311	147,254	138,670	151,024	136,548	128,462
Pondera	300,556	821	27,818	21,923	24,057	20,802	26,698	22,400	27,427	28,523	27,740	25,904	24,053	23,211
Total	6,580,745	17,980	526,510	502,164	521,184	520,317	617,569	556,810	591,194	587,631	508,281	576,753	540,074	532,258
Daily average	17,980	.....	16,984	17,316	16,812	17,344	19,922	18,560	19,071	18,956	16,943	18,605	18,002	17,170

Colorado

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Florence	56,721	155	3,172	5,403	5,933	4,635	4,727	5,940	4,697	4,851	4,348	4,486	4,654	3,875
Fort Collins	58,107	159	5,314	5,494	5,077	4,737	4,115	4,050	5,330	4,717	4,466	5,015	5,142	4,650
Iles Dome	579,260	1,583	57,289	52,290	52,255	49,266	45,521	45,274	47,593	47,072	42,981	44,677	46,682	48,360
Hiawatha	79,933	239	.....	5,006	5,352	5,207	5,030	4,950	12,539	9,839	8,456	8,494	7,650	7,410
Moffat	113,665	311	9,092	8,753	8,651	8,803	8,985	8,250	9,345	8,638	8,338	12,485	12,095	10,230
Greasewood	8,773	24	974	455	849	565	1,016	750	835	895	672	676	621	465
Price	123,051	336	15,725	17,537	10,222	4,356	23,194	13,450	8,625	7,951	4,214	7,292	4,130	6,355
Rangely	33,779	92	2,688	2,348	1,988	2,179	2,803	4,800	2,398	3,131	3,016	2,878	2,915	2,635
Tow Creek	49,240	135	4,581	4,371	3,417	4,742	4,517	3,750	4,615	4,384	3,757	4,129	3,872	3,105
Wellington	69,173	189	5,932	6,235	5,888	6,257	6,254	6,450	6,637	6,106	5,812	5,452	4,970	3,180
Wilson Creek	229,875	628	16,621	18,359	20,291	19,097	18,102	18,312	19,939	20,925	18,198	18,356	18,270	23,405
Total	1,401,577	3,829	121,388	126,251	119,923	109,844	124,264	115,976	122,553	118,509	104,258	113,940	111,001	113,670
Daily average	3,829	.....	3,916	4,353	3,868	3,661	4,009	3,866	3,953	3,823	3,475	3,675	3,700	3,667

Wyoming

Field—	Total	Dly av.	January	February	March	April	May	June	July	August	September	October	November	December
Salt Creek	5,314,209	14,520	450,576	412,864	434,595	538,896	451,483	451,800	462,024	439,764	417,978	413,369	420,035	420,825
Badger Basin	95,478	261	5,200	7,018	7,440	7,260	7,440	7,200	9,920	9,920	9,600	7,440	9,600	7,440
Big Muddy	434,880	1,188	35,753	34,104	37,163	35,532	36,328	35,184	36,296	36,517	37,826	36,242	37,820	36,115
Black Mountain	57,840	158	2,000	7,250	6,200	6,000	6,200	6,000	4,340	4,650	4,500	3,100	4,500	3,100
Byron	824,606	2,254	76,781	65,042	111,175	1,632	126,705	74,500	.....	88,156	89,209	71,128	820	119,660
Cole Creek	152,350	416	5,447	4,242	4,182	4,463	11,813	9,090	14,209	16,077	18,816	23,131	18,870	22,010
Dallas-Derby	169,116	462	14,436	13,224	12,490	12,000	12,689	12,210	10,916	14,297	14,782	20,107	14,760	17,205
Elk Basin	237,918	650	20,598	19,325	18,806	19,233	9,141	16,500	21,982	21,743	20,234	20,201	35,470	14,685
Frannie	955,993	2,612	52,950	52,798	80,570	89,797	70,164	75,390	76,409	88,270	95,938	87,772	95,415	90,520
Garland	1,106,672	3,024	85,188	109,748	116,610	103,732	91,895	100,800	96,150	98,357	88,348	63,229	90,670	61,845
Grass Creek	711,642	1,944	53,399	50,131	50,820	54,033	19,675	43,380	126,090	92,967	64,224	52,868	50,425	53,630
Hudson	86,513	236	7,317	6,606	7,128	6,829	9,068	7,200	7,233	7,137	10,037	5,553	6,980	5,425
La Barge	531,109	1,451	35,914	30,750	34,267	33,119	39,303	41,990	49,540	48,067	47,898	54,871	57,420	57,970
Lance Creek	9,200,356	25,138	745,466	665,592	722,594	699,034	758,378	746,100	883,446	848,263	771,413	795,777	771,778	792,515
Lost Soldier	853,547	2,332	52,717	51,903	60,054	63,176	68,051	58,110	59,007	57,548	51,281	96,460	100,235	135,005
Mule Creek	78,118	213	6,200	5,800	7,361	6,000	6,200	6,000	6,200	10,999	6,548	5,115	6,580	5,115
Mahoney Dome	157,538	430	9,428	9,209	9,165	9,731	9,544	7,800	9,646	9,957	8,780	13,768	20,520	39,990
Big Medicine Bow	274,746	677	24,280	23,191	26,929	22,648	22,586	22,200	22,065	22,724	22,010	21,931	21,862	22,320
Oregon Basin	2,036,138	5,563	116,351	92,491	123,881	129,902	222,987	187,110	220,540	216,296	193,711	173,504	193,815	165,550
Osage	219,620	600	18,608	17,400	18,612	18,000	18,600	18,000	18,600	18,600	18,000	18,600	18,000	18,600
Quealy Dome	178,071	487	18,416	17,346	15,727	14,820	14,490	14,190	14,087	13,954	13,488	13,986	13,462	14,105
Rock River	921,894	2,519	79,571	74,564	79,660	75,757	77,552	75,390	76,808	76,482	74,844	77,739	75,872	77,655
Wertz	1,113,300	3,042	122,888	71,006	59,952	59,781	59,851	58,500	59,890	215,109	153,327	56,276	153,320	43,400
Hamilton Dome	222,017	607	.....	7,250	.....	.....	.....	29,610	40,935	37,605	38,340	32,167	36,110	.....
Miscellaneous	198,205	.....	6,539	8,919	10,846	10,856	12,278	9,600	18,137	23,336	29,129	32,298	15,032	21,235
Total	26,132,076	71,399	2,046,023	1,837,773	2,056,225	2,022,231	2,162,421	2,113,854	2,344,470	2,516,795	2,300,261	2,196,732	2,269,371	2,245,920
Daily average	71,399	.....	66,001	64,061	66,330	67,408	69,756	70,462	75,628	83,893	76,675	70,862	75,646	72,449

Miscellaneous fields include: Cody Dome, 22,270 bbl.; Dewey Dome, 2,130 bbl.; Dutton Creek, 18,121 bbl.; East Mahoney, 12,810 bbl.; Iron Creek, 3,313 bbl.; Poison Spider, 43,491 bbl.; Hidden Dome, 26,154 bbl.; Spindletop, 2,548 bbl.; South Casper Creek, 30,698 bbl.; Teapot, 5,576 bbl.; Warm Springs, 26,215 bbl.; Maverick Springs, 4,329 bbl.

Northwest New Mexico

NW. NEW MEXICO—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Aztec-Bloomfield	1,185	3	95	140	.....	.....	.....	.....	122	126	91	2	294	315
Hogback	73,421	201	6,012	6,058	5,925	5,961	6,200	6,204	6,353	6,404	5,936	6,113	6,047	6,208
Rattlesnake	143,297	392	12,677	14,734	10,092	10,746	10,230	21,730	11,466	11,449	9,713	9,231	10,376	10,853
Table Mesa	36,145	99	2,535	3,139	3,044	1,725	2,790	2,621	3,353	4,667	2,870	3,052	2,829	3,520
Total	254,048	694	21,319	24,071	19,061	18,432	19,220	30,555	21,294	22,646	18,610	18,398	19,546	20,896

southwest of the discovery. It ran into gas at 400 ft. and was completed at that depth for 150,000 cu. ft. a day to be saved for fuel purposes. However, these two wells attracted attention and La Barge operators began drilling northward. During 1940 there were 15 wells drilled on both sides of the line between Sections 27 and 28 and extending a mile to the north of the older part of the field. These wells came in for 25 to 315 bbl. a day, most of them producing from a second sand and some of them flowing and on an average being better wells than in the old district. Marvel Oil Co. 1-H Government, CEL NE SE Section 28, made 315 bbl. in sands at 923-74 and 994-1,065 ft. Same company's south offset flowed 300 bbl. Texas Co. 1-G Government, an east offset, averaged 207 bbl. a day on a 6-day test. Approximately 200 acres were proven up, including 80 around the north well in Section 8. Two dry holes between the north wells and the La Barge extension may be off structure or indicate that the two areas are separate. no further drilling in between having so far taken place. These were in CNL NE SW Section 21 and SW SW SE Section 16.

Little Lost Soldier

The discovery in a deeper pay in Little Lost Soldier was made in the Sinclair-Wyoming Oil Co. 75-A, NW SW NW 11-26n-90w, Sweetwater County, an old well drilled deeper. It was originally completed in the Tensleep at 4,005 ft. in 1930 for 2,500 bbl. a day of 35-gravity oil. In October it was recompleted at 4,244 ft. in the basal Tensleep for 1,420 bbl. naturally and then made 2,157 bbl. in 24 hours on gas lift. Two other wells then were deepened, No. 77-A, SE NE NE 10-26-90, from 4,049 ft., to 4,285 ft. and was recompleted for 840 bbl. in 24 hours, and No. 78, SW SW NW Section 11, from 4,087 to 4,448 ft., and recompleted for 32 bbl. in 20 hours. These two wells made 155 and 272 bbl. initially when originally completed.

West Ferris and Mahoney

The West Ferris discovery in a deeper pay was made in March in Sinclair-Wyoming 4-E, C SE SW 29-26n-87w, Carbon County. The first produces gas in the Dakota and Sundance, but had been given no conclusive test in the lower sands. It topped the Tensleep at 4,272 ft. and was drilled to 4,315 ft., where it encountered water in the basal part of the sand. It was plugged back to 4,293 ft. and flowed 54 bbl. a day through the tubing, the oil testing 42 gravity. No other wells were drilled during the year in that area.

The Mahoney Dome discovery in a deeper pay was made in Sinclair-Wyoming 3-F Mahoney, C SE NW 34-26n-88w, Carbon County. It was originally completed in 1938 in the Tensleep at 4,295-4,486 ft. for 172 bbl. naturally. In November it was recompleted at 4,505 ft. for 838 bbl. in 15½ hours after a shot with 500 qt. at 4,363-4,505 ft. Two other wells were being deepened at the end of the year.

Lance Creek

Drilling in Lance Creek mostly was confined to proven locations with the exception of three wells on the extreme eastern end which proved up approximately 160 acres for Sundance sand production. These were Ohio 8 State, NW NW NW 36-36n-65w, which flowed 60 bbl. an hour from the basal Sundance at 4,330-40 ft., same company's 9 State, NW SW NW Section 36, for 315 bbl. of oil and 30 bbl. of water from sand at 4,420-68 ft., and Continental 3 Rodeo-4, SE NE NE Section 35, which made 168 bbl. in 24 hours through the tubing. The performance of the wells indicates that a further extension to the east may be expected, but drilling has been held up pending adjustment of title complications with the Government, an early settlement of which is expected. The northern limits of the Leo horizon were defined in March in Ohio 6 Agnes Rohlff, SE NE NE 32-36n-65w, which went to 5,731 ft., coring water sand at 5,723-29 ft. and dry sand at 5,729-31 ft. It had the red marker at 5,475 ft. Elevation of the rotary table was 4,434 ft. The limits on the west side were defined in Argo Oil 1 Ong, SE SE SW 31-36n-65w, which drilled into a thrust fault and failed to pick up any of the regular producing sands. It was abandoned at 5,623 ft. A. B. Cobb drilled a south offset with some results, stopping at 5,601 ft. in Cretaceous black shale. Sixty-two wells were completed in the field, of which three were dry holes and three were Sundance sand wells.

WYOMING

Completions by Months

January	17	8	5,349	7	2
February	10	8	6,594	1	1
March	13	11	16,235	2	0
April	12	11	6,505	1	0
May	12	9	8,612	3	0
June	10	8	4,520	2	0
July	13	8	5,113	4	1
August	20	15	16,951	5	0
September	20	14	6,549	5	1
October	18	10	5,130	7	1
November	21	14	5,934	6	1
December	13	8	2,691	4	1
Total	179	124	90,183	47	8

Wertz and Frannie

The Tensleep horizon was extended on the east side of the Wertz field in Sinclair-Wyoming 14 unit, NW SW NE 7-26n-89w, which made 201 bbl. an hour through the 2-in. tubing at 6,043 ft., total depth. Top of the sand was at 5,997 ft. It is ¼ mile northeast of 10-A Wertz, nearest producer. A development campaign was inaugurated late in the year and at the beginning of 1941 there were six wells drilling.

The Frannie field in Park County had two extensions of the Tensleep horizon on the northeast and northwest sides. In September, V. M. Kirk 3 Government, NW NW SW 24-58n-98w, was completed at 3,023 ft., total depth, for 350 bbl. a day naturally from the Embar-Tensleep. Top of Embar was at 2,911 ft. and of the Tensleep at 2,945 ft. The extension on the northwest was about 2,000 ft. ahead of production and on the Montana side in Continental Oil 1 Prigge, SE SE SE 33-9s-25e, Carbon County, Montana, which was completed at 3,562 ft. for 124 bbl. in 24 hours on the pump after acidizing with 1,000 gal. It had the top of the Embar at 3,490 ft. and of the Tensleep at 3,523 ft. The two wells proved up about 240 acres with about 1,200,000 bbl. in reserves.

Gas Field Extensions

Three of the producing gas fields were extended. The Muskrat field in Fremont County had a downstructure test on the northwest flank in Sinclair-Wyoming 2-A Muskrat, NW SE SW 34-34n-92w. It

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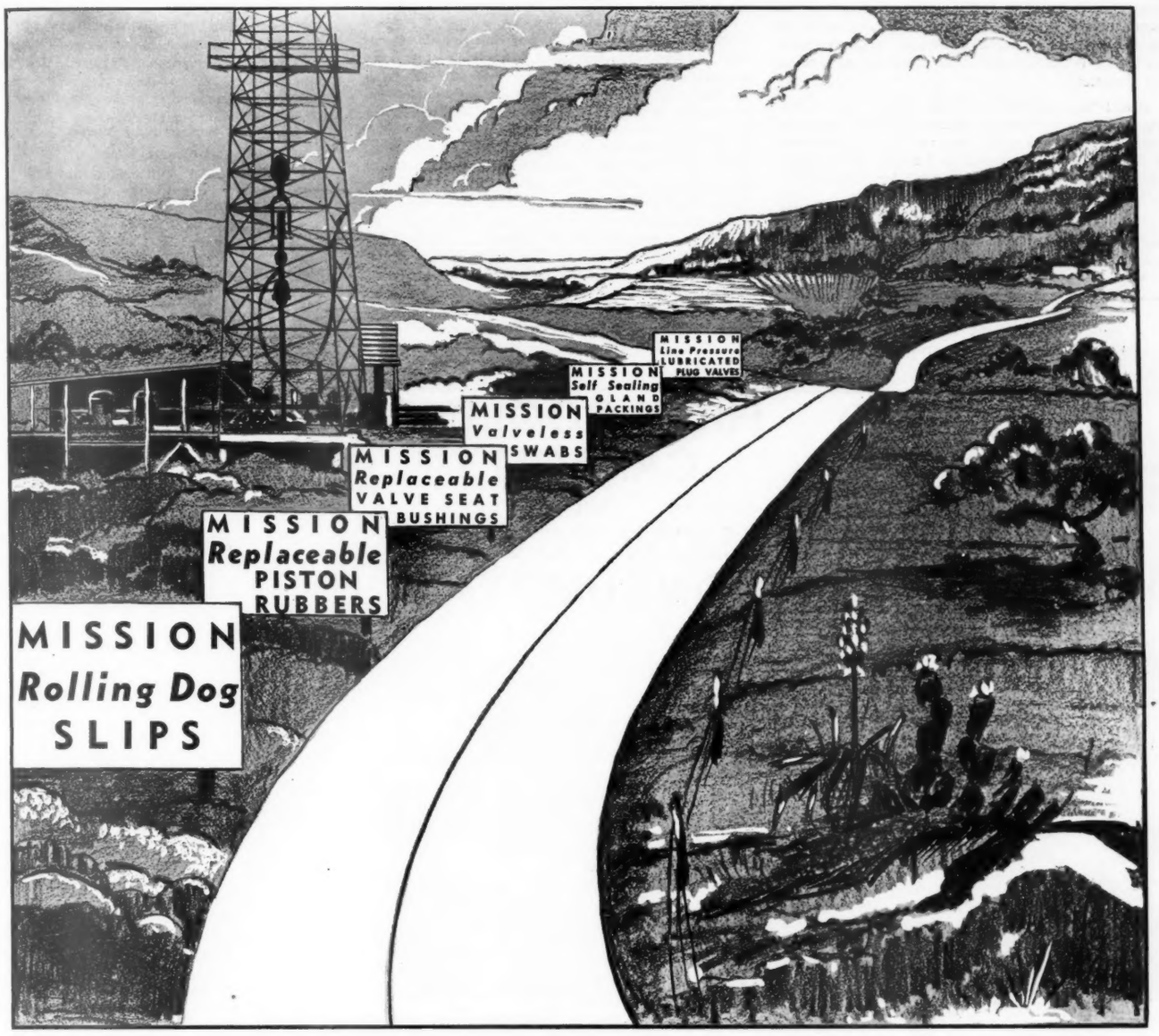

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went to the Sundance at 5,838 ft., total depth, and plugged back to the Frontier and was completed for 10,000,000 cu. ft. through casing perforated at 4,170-90 ft. Estimated open flow capacity was 45,000,000 cu. ft. It marks an extension of nearly ½ mile in the Frontier.

Sinclair-Wyoming 12 unit, SW SE NW 25-32n-95w, Big Sand Draw field in Fremont County, extended the Frontier gas sand ⅝ mile to the south and east in July. After being drilled to 3,832 ft. and plugged back to 3,610 ft. it was completed for 4,000,000 cu. ft. in sands at 3,370-3,440 ft. and 3,525-80 ft.

The Hiawatha gas field, in Sweetwater County, which lies mainly in Moffat County, Colorado, was extended on the Wyoming side in Vermillion Oil Co. 1 Amelia Horrocks, SW SW SW 7-12n-99w, a mile north of the nearest producer. It was completed late in December for 12,000,000 cu. ft. a day, with a rock pressure of 1,200 lb. in sands at 3,474-96 ft. and 3,505-40 ft. Production is from the Wasatch of Tertiary age.

MONTANA

There was a pronounced increase in drilling activity in Montana in 1940, but this was confined almost entirely to progressive drilling of offsets in the Cut Bank and Kevin-Sunburst fields with only about eight wildcats drilled to completion. There were 234 completions, an increase of 64 over 1939. Of these 109 were in the Cut Bank district and 88 in Kevin-Sunburst. The number of wells included 155 oil producers, 38 dry holes and 41 gas wells. New production amounted to 17,479 bbl. as against 9,728 bbl. in 1939, a gain of 7,751 bbl.

There were no discoveries, and extensions were limited to outposts one to two locations ahead of production in the producing fields, all being within what was considered proven territory, except the Frannie field in Wyoming was extended over into Carbon County, on the Montana side in Continental 1 Prigge, an account of which is carried in the Wyoming summary. The most noteworthy extension in Cut Bank was in A. B. Cobb 6 Walberger, SE SW SE 33-35n-6w, on the west side, a little more than ½ mile west of the nearest producer. It swabbed 45 bbl. from the Cut Bank sand at 2,795-2,812 ft. in 12 hours. The record well from the Cut Bank sand was drilled in the south end of the field in December in Texas 9 State, C NW NE 16-32n-5w, which swabbed 410 bbl. first 18 hours and then flowed and swabbed 672 bbl. in the next 24 hours. Its size was its only unusual feature.

Completions by Months

January	12	7	602	2	3
February	9	7	939	2	0
March	10	5	669	5	0
April	14	14	1,568	0	0
May	26	21	2,780	3	2
June	17	12	697	4	1
July	24	19	2,335	3	2
August	27	16	1,369	4	7
September	27	13	1,500	8	6
October	23	13	1,440	5	5
November	29	17	1,972	2	10
December	16	11	1,608	0	5
Total	234	155	17,479	38	41

UTAH

Three wells were drilled to completion in Utah in 1940, all of which were in the Clay Basin gas field in Daggett County, in the northeast corner of the state, all drilled by the Mountain Fuel Supply Co. One of these defined the limits of the field on the northeast and another extended the proven area ¾ mile to the west. Mountain Fuel 5-B Murphy, SW NE SW 15-3n-24e, was drilled to 6,064 ft. and was plugged and abandoned. It had the top of the Frontier at 5,581 ft. Location is ½ mile northeast of 2 Murphy, and limits the field in that direction. No. 1 Government, SE NE NE 19-3n-24e, which marks the west extension, was completed at 6,005 ft. in the Dakota for 15,214,000 cu. ft. The third well was on the southwest side in territory expected to be productive.

Completions by Months

January-March	0	0	0	0	0
April	1	0	0	0	1
May-August	0	0	0	0	0
September	2	0	0	0	2
October-December	0	0	0	0	0
Total	3	0	0	0	3

COLORADO

Completions in Colorado in 1940 were the smallest in number over a period of 12 years, the total being 19, of which 10 were oil wells, 8 were dry holes and 1 was a gas well. New production, however, was 409 bbl. a day over the 1939 figure.

Wilson Creek

The most important development of the year was the extension of the proven area in the Morrison sand on the Wilson Creek structure in Rio Blanco County in Texas 4 Unit, NW NW NW 2-2n-94w, a joint operation with the California Co. It was drilled to 6,698 ft. and encountered water in the Sundance sand. It was then plugged back to 6,604 ft., where the 7-in. was set and then perforated opposite the Morrison sand at 6,465-6,500 ft. It showed for better than 1,000 bbl. while testing, but the only official figures released were on a 24-hour gage through a ⅝-in. choke on the tubing in which period it made 442 bbl.

The discovery was made early in 1938 in 1 Unit, SW SE NW 35-3n-94w, in the Morrison sand at 6,665-85 ft., the well flowing 492 bbl. of 46-gravity paraffin-base crude in 24 hours through perforated casing. Their 2 Unit, NW SE SW Section 27, a little more than a mile to the northwest, produced 250 bbl. from the Morrison upon completion in 1939. Early in 1940 their 3 Unit, NE NE NE 27-3n-94w, 1¼ miles north and west of the discovery, found water in the Morrison at 5,897-6,333 ft., and was abandoned. Their 4 Unit, which marked the 1940 extension, is located a mile south of the discovery and proved up approximately 240 acres additional and adding at least 2,400,000 bbl. to the reserves. This brings the total proven area up to around 680 acres with the limits defined only on one side.

Hiawatha Gas Field

Another development of interest, although it proved up no additional acreage, was in Mountain Fuel Supply Co. 5-A Wilson, SW SW NW 23-12n-100w, on the east side of the Hiawatha gas field in northern Moffat County. It was drilled primarily for a conclusive test of sands in the Wasatch which had shown oil in nearby wells and was completed early in June for 327 bbl. first 24 hours and the same quantity in the second period and was still making 300 bbl. 2 months later. It was drilled to 2,592 ft. and the 6⅝-in. was

(Continued on Page 150)

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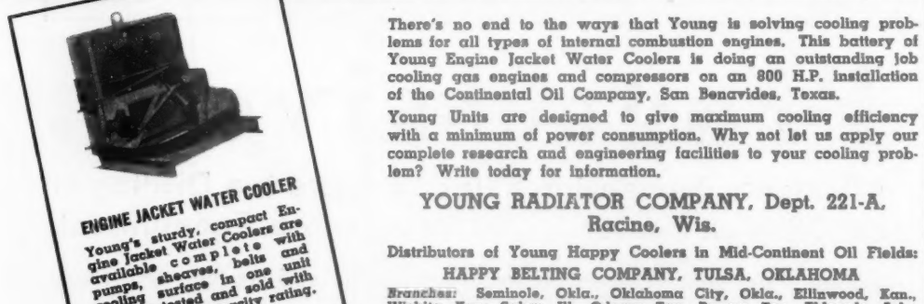

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Illinois Annual Review

(Continued from Page 133)

itial of completions is 245 bbl., but this includes multi-zone wells.

In Edwards County, the Albion pool has been quite active, but three dry holes and a temporary abandonment has caused some curtailment; production is from the McClosky at about 3,150 ft. The Thompsonville pool in Franklin County is producing from the McClosky at about 3,140 ft. with the wells on the better part of the structure running around 350 bbl. initially. Near Benton, also in Franklin County, there has been a burst of activity due to a drilling test showing good possibilities. Pools in Gallatin County have not been particularly impressive although the Inman field has been producing from three zones, the Palestine, the McClosky lime and the Rosiclare sand.

The Hoodville field in Hamilton County obtains most of its production from the Bethel sand at approximately 2,950 ft. although there is some McClosky production at about 3,100 ft. Bethel wells average about 154 bbl. initially. The Dale pool, originally developed in the Weiler sand, is now getting some wells to the McClosky, a well being recently completed there for 780 bbl. initial.

Another area which increased its production through the development of new fields and discoveries was the Central basin area composed of Wayne, Clay, Richland and Jasper counties. The decline in Clay County production was more than offset by a new discovery in and the development of fields already known in Wayne County. In addition, Jasper County became an oil-producing country for the first time and had a production of 196,637 bbl. from four pools for the month of December. Daily average production for the four-county area was 41,687 bbl. during January and 48,545 bbl. during December 1940.

In Wayne County the Enterprise, West Enterprise and Boyleston fields have been recently active. These are all McClosky fields, the first two finding the pay at about 3,050 ft. and the latter at about 3,250 ft. Initials in the area are around 200 bbl. daily. In Barnhill a recent completion was bottomed in the Salem formation at 3,792 ft. This well made an initial of 58 bbl. In Clay County, work is at a virtual standstill with an occasional well being drilled to the McClosky sand at about 3,000 ft.

In Jasper and Richland counties, things are moving quite briskly with the West Liberty field (5n-10e and 6n-10e) holding the center of the stage. Production there is from the McClosky at about 2,795 ft. and the wells have high initials, around 1,000 bbl. Pure Oil Co. dominates the picture in the area. Also in Jasper County, the Boos and North Boos pools, both in 6n-10e, are being developed, but the wells are smaller and the campaign is less intense; these two fields are also McClosky fields and four recent dry holes have discouraged development.

The Dundas pool in 4n-9e and 10e and 5n-10e, Richland County, have been providing about six wells a month of about 150-bbl. initial. Production is from the McClosky at 2,930 ft. The Noble field is almost completely drilled up, but there is a secondary exploitation program in progress, McClosky wells being plugged back to the Weiler sand and an occasional new well drilled to that horizon.

Effingham County got its first pool and the Louden field was extended into that county. The Effingham County discovery has not been in long enough to indicate what its potentialities are. Bond, Jefferson, Coles, Montgomery and Marion counties each had a discovery but none of them were outstanding, the Coles County venture being particularly disappointing. Washington County had two new discoveries and an extension while Clinton County had one new discovery and a deeper pay zone uncovered.

Activity is practically at a standstill in the Marion County fields. Salem is preparing for some activity with the completion of Rossi's Trenton test, but aside from that it has only inside locations and possible deepening jobs. The McClosky and Devonian lime horizons have declined to the point where the drilling of a new well is a risky venture. Sandoval (2n-1e) is almost completely drilled up and Fairman (18-3n-1e) is receiving little development. Small activity continues in the Centralia field with an occasional well being drilled to the Benoist sand.

The Louden pool continues to dominate the picture in Fayette County. Most of the work is in the exploitation of the Weiler and the Stray zones, the depth to the pay varying from 1,490 to 1,590 ft., depending on the position on the structure. Where the two-zone method of completion is used, these wells will have initials as high as 600 bbl. Many of them produce around 100 bbl. initially.

Prospects

At the present time it appears that the state has passed both its production and drilling-activity peaks. Fields being discovered and developed currently are not large enough individually to cause outstanding period of development of output. They are large enough collectively to provide a sustained drilling campaign and to partially offset the decline in the fields already developed.

The wildcat campaign in the state has diminished but the decline in numbers has been offset to some extent by the entry of the major companies with ample seismograph and subsurface information on which to base the location of tests. Many of the major structures have been tested, but there are enough remaining to provide plenty of hunting grounds for the next several years. The search will be mainly directed to the McClosky and upper formations. Total number of wells drilled during the coming year will be about 25 per cent less than during 1940. This may be upset by the discovery of a single large field such as Salem or Louden were.

ILLINOIS FIELDS

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	234	182	111,809	50	2
February	288	248	334,028	37	3
March	281	238	195,910	39	4
April	287	254	157,910	32	1
May	399	342	361,211	57	0
June	391	337	265,912	53	1
July	340	250	138,311	90	1
August	415	311	121,659	102	2
September	334	262	59,967	72	0
October	281	213	49,972	68	0
November	328	244	57,218	83	1
December	236	168	35,637	67	1
Total 1940	3,814	3,049	1,889,544	750	15
Total 1939	3,582	2,943	838,989	621	18
Difference	232	106	50,555	129	3

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RANK WILDCATS OPEN NEW AREAS; MANY POOLS ARE LINKED

By ROBERT INGRAM

POOL development and outpost drilling in Kansas during 1940, which was the most extensive since the record-breaking year 1937, established a tendency long predicted by many students of the area for groups of pools along the Barton arch, or Central Kansas uplift, to be combined into single large fields. In addition a number of new pools were opened.

Outstanding among the large fields added to or joined together were Hall-Gurney in Russell County; Silica in Barton, Rice and Ellsworth counties; Trapp in Barton and Russell counties; Stoltenberg in Ellsworth County; Bornholdt in McPherson County; Orth in Rice County, and Bloomer in Rice County.

There were also indications that the group of pools a little farther northwest along the arch in the Bemis-Shutts area of Ellis County would also soon be joined and the opinion was expressed by some that the entire area will one day be defined by only four or five large fields.

This opinion was supported by the general similarity of both sands and structure in the large areas, and also by the fact that so far dry holes have not defined productive limits but have only condemned the locations on which they are drilled. Often dry holes are very close to production on all sides.

Joining of pools will continue during the coming year in light of the sustained drilling campaign in Barton, Ellis, McPherson, Rice and Russell counties. These five counties set the pace for the entire state for field activity and accounted for more than half of all the wells drilled—1,065 out of a total of 1,817. At year's end, new locations were still chiefly in these same counties.

Wildcatting

For the most part, wildcatting was planned along three general trends, all of which were related to the proven areas of the Barton arch. Success kept all three directions active, although attempts to prove the region which may be expected to be a continuation of the arch to the northwest were not as spectacular as along the north flank and the southwest flank.

There were, however, three tests to the northwest which established that the general subsurface conditions continue in that direction. One of these was the Ray pool in Phillips County, brought in late in the year by Cities Service Oil Co. at 1 Ray, NE NW SE 32-5-20w.

The others were Alva Billings 1-A Ryan, E½ NE SE 27-8-32w, in Thomas County, which had several showings late in the year, and R. W. Shields 1 Paxson in Graham County, which came in as a producer.

Exploration was intense and successful along the north flank of the arch in Russell and Ellsworth counties near Stoltenberg, Greenwood and in between, and half a dozen new pools were opened. Extension to the southwest also paid off well, particularly in Stafford County where Bedford, Riley and Stafford pools were opened. Stafford County, at the same time, had nearly as many completions during the year as Ellsworth and McPherson counties with 117 wells drilled.

Typical of the western Kansas fields is the Silica-Ellinwood district in southeastern Barton counties which was extended a number of times during the year and was joined with several neighboring pools. The area is spotted with dry holes, but operators merely plug them and go ahead to drill producing wells on offset locations.

On September 28 the Kansas nomenclature committee suggested that Silica, Silica South and Ellinwood be joined, and that Clawson and Marchand be combined in Clawson. A month later the committee suggested that Clawson and Silica be joined and called Silica, since offset production became established between the two.

Earlier in the year, Ellinwood West and Wolf were combined in Ellinwood West, Marchand West was joined to Clawson and Ellinwood West was combined with Silica. By the year's end the Silica field was defined by the nomenclature committee as comprising 27,200 acres, and the end was not yet in sight.

Although dry holes will be interspersed among the several pools in southwestern Russell County and in other sections of Central Kansas, many locations remain to be drilled in several pools and are scheduled for the new year.

Another typical pool is Stoltenberg, discovered in June 1931, when Palmer and Gypsy Oil Co. completed 1 Stoltenberg, C SW 22-16-10w, in Arbuckle lime. The second well was completed soon thereafter by Derby Oil Co. Development was slow for several years, but activity began to increase during the past year when lease expiration dates neared and production has been proved on 24 quarter sections.

Pools were also opened at nearby locations which will probably soon be joined to the one area. They are now known as Stoltenberg West, Stoltenberg Northwest and Stoltenberg Southwest.

Stafford County Development

Stafford County experienced a new cycle of exploration and drilling following the discovery of two new pools in August and opening of a second prolific pay zone in the Zenith pool. The Viola lime was found productive at Zenith early in the year. Previously it had produced only from Misener sand.

Working under one of the first spacing orders to be issued in the state, operators are proceeding with a systematic development of both zones and the field was extended several times during the year. Many large producing wells were drilled, particularly in the north end of the field. Total daily potential as fixed by the Kansas Corporation Commission rated Zenith fourth among Kansas fields with more than 350,000 bbl. daily. Only Trapp, Bemis and Silica had larger potentials.

Late in the summer an important extension was completed southeast of the South Sittner pool, and

(Continued on Page 145)

DISCOVERIES IN KANSAS DURING 1940

Field and county—	Location	Operator	Month	Number wells	Producing formation	Total depth, ft.	Initial potential
N. Bornholdt, McPherson	18-20-5w	Central & Springrose	January	(*)	Chat	3,348	3,000
Hall-Arbuckle, Russell	23-14-13w	Stanolind Oil & Gas Co.	January	5	Arbuckle	3,190	294
Snider-Simpson, Stafford	9-21-11w	Shell Oil Co., Inc.	January	2	Simpson	3,388	378
Ernsting-Arbuckle, Barton	1-20-12w	Crown Petroleum et al	February	3	Arbuckle	3,375	191
Rahn, Cowley	13-34-5	Jock Garden	February	1	Bartlesville	2,950	1,035
Knop, Barton	6-20-11w	Brown-Willard Oil Co.	February	1	Arbuckle	3,352	229
Krier-Arbuckle, Barton	31-16-11w	Texas Co.	March	2	Arbuckle	3,341	267
NE. Stoltenberg, Ellsworth	35-16-10w	Lauck & Moncrief	March	15	Arbuckle	3,322	911
Wondra, Barton	15-17-12w	Phillips Petroleum Co.	March	1	Lansing	3,054	101
Gurney-Basal, Russell	25-14-14w	Skelly Oil Co.	March	11	Basal sand	3,139	539
Beaumont-Arbuckle, Greenwood	25-27-8	Beaumont Oil Co.	March	3	Arbuckle	2,744	50
Severy-Topeka, Greenwood	17-28-11	Ray, Reed et al	April	1	Topeka	765	30
Krier-Lansing, Barton	30-16-11w	B. B & M. Oil Co. et al	April	8	Lansing	3,047	3,000
Kroutwurst, Barton	34-16-11w	George Hinkle	April	1	Arbuckle	3,402	60
Hoffman-Arbuckle, Barton	18-16-11w	M. B. Armor and Vernon Oil Co.	May	2	Arbuckle	3,321	3,000
Hall-Tarkio, Russell	28-14-13w	R. H. Shields	May	2	Tarkio	2,325	2,295
Bitikofer, McPherson	1-20-1w	Saco & Aladdin	May	1	Chat	2,916	49
W. Lost Springs, Marion	30-17-4	Harrington & Larleaux	May	1	Chat	2,420	800
Haska, Ellsworth	6-16-10w	Aylward Production Co.	June	3	Arbuckle	3,292	2,321
McLouth, Jefferson	4-10-20	Young & McLaughlin	June	1	Mississippi	1,596	40
Arkansas City, Cowley	15-34-3	W. M. McKnab	June	1	Burbank	3,286	231
Sander, Ellis	30-13-16w	Gulf Oil Corp.	June	1	Arbuckle	3,458	312
Hammer, Barton	35-19-12w	C. L. Carlock	August	1	Arbuckle	3,370	441
W. Bemis-Shutts, Ellis	17-11-17w	Champlin Refining Co.	September	3	Arbuckle	3,400	3,000
Ray, Phillips	32- 5-20w	Cities Service Oil Co.	September	5	Basal sand	3,603	2,135
Karber, Rice	7-19-10w	C. L. Carlock	November	2	Arbuckle	3,350	280
Lewis, Russell	28-14-12w	Jones & Shelburne	October	1	Wabaunsee	2,329	1,463
Bedford, Stafford	21-23-12w	Shell Oil Co., Inc.	September	5	Arbuckle	3,854	2,700
Riley, Stafford	28-23-11w	Shell and Atlantic	September	1	Lansing	3,772	1,342
Stafford, Stafford	15-24-12w	Stanolind Oil & Gas Co.	August	5	Viola	4,021	3,000
Henne, McPherson	21-17-1w	Morine & Williams	December	2	Mississippi	2,661½	495
NW. Greenvale, Russell	32-14-12w	Magnolia Petroleum	December	1	Lansing	2,956	319
Gueda Springs-Arbuckle, Cowley	8-34-3e	E. B. Shawver	December	1	Arbuckle	3,735	425
Juka-Arbuckle, Pratt	1-27-13w	Skelly Oil Co.	December	1	Arbuckle	4,295	1,572
Keesling-Arbuckle, Rice	9-20-9w	Schneider	October	1	Arbuckle	3,235	248
Raymond-Lansing, Rice	16-20-10w	Hall & Branine	November	1	Lansing	3,160	186
Sellens-Arbuckle, Russell	36-15-13w	Sinclair Prairie Oil Co.	November	1	Arbuckle	3,360	306
Trapp-Arbuckle, Russell	26-15-14w	Eichman	October	1	Arbuckle	3,365	988
Shallow Water-Mississippi, Scott	11-20-33w	Atlantic and Hamlin	September	1	Mississippi	4,645	249
N. Prusa-Shawnee, Barton	17-16-11w	Armer & Vernon	October	1	Shawnee	....	68
		GAS DISCOVERIES					
Kaths, Johnson	33-13-12	F. J. Gasper, trustee	January	2	Squirrel	794	500 M.c.f.
———, Cowley	16-34-5	Mission Oil Co. et al	March	1	Sand	1,756	2,500 M.c.f.
McLouth, Jefferson	4-10-20	McLaughlin Sons, Inc.	April	1	Bartlesville	1,916	8,000 M.c.f.
Coons, McPherson	13-19-1w	E. K. Carey Drilling Co.	December	..	Mississippi	3,425	3,000 M.c.f.

*Now included in Bornholdt field.

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KANSAS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly av.	January	February	March	April	May	June	July	August	September	October	November	December
BARBER COUNTY—														
Whelan	94,759	259	6,083	5,401	6,375	6,125	6,885	8,100	13,274	7,901	9,002	9,436	7,853	8,324
Miscellaneous	27,704	.....	2,629	1,980	2,493	2,043	1,272	1,962	2,343	2,636	2,515	2,927	2,381	2,523
Total	122,463	335	8,712	7,381	8,868	8,168	8,157	10,062	15,617	10,537	11,517	12,363	10,234	10,847
BARTON COUNTY—														
Ainsworth	468,460	1,260	53,351	44,747	43,214	36,383	37,541	35,433	35,625	34,207	36,863	36,145	36,384	38,567
Beaver-Feltes	248,387	679	17,205	17,429	20,088	23,083	21,173	29,377	24,052	16,811	18,545	20,953	19,258	20,413
Bloomer-Stumps-Breford	1,784,641	4,876	172,316	136,068	164,641	123,300	136,673	135,667	135,717	141,420	160,789	163,165	155,385	159,500
Kraft and N. Kraft	339,522	928	26,877	25,752	26,133	22,354	25,420	26,210	27,782	28,707	32,302	30,858	32,586	34,541
Prusa-Krier	439,061	1,200	29,921	28,001	36,456	28,705	35,278	37,450	40,824	36,411	42,436	39,302	42,291	41,986
Silica-Raymond	5,740,305	15,684	515,354	479,719	470,425	343,889	399,189	418,485	493,897	502,220	538,497	521,912	539,168	517,550
Miscellaneous	187,878	.....	15,911	17,611	18,042	15,575	15,624	16,464	17,544	14,360	11,941	14,105	12,900	17,801
Total	9,208,254	25,159	830,935	749,327	778,999	593,289	670,898	699,086	775,441	774,136	841,355	826,440	837,972	840,358
ELLIS COUNTY—														
Bemis-Walters	3,651,655	9,977	285,846	255,631	268,742	254,790	249,643	355,011	340,395	335,953	328,639	327,785	321,583	327,637
Burnett	1,770,137	4,836	98,239	87,986	129,797	162,584	105,927	151,258	181,604	173,362	171,388	170,353	163,277	174,362
Blue Hill	96,910	265	3,038	4,292	5,673	6,089	5,394	10,146	8,983	8,599	11,407	11,570	10,099	11,620
Ruder	64,998	178	5,487	4,930	6,324	5,970	6,045	5,970	5,146	5,394	5,580	5,177	4,335	4,640
Solomon	42,875	117	341	1,479	1[illegible]	439	.....	1,765	1,772	6,851	5,182	12,976	.....	11,884
Miscellaneous	111,200	.....	8,160	8,555	10,261	7,235	7,874	10,120	10,253	8,933	9,718	11,977	8,381	9,733
Total	5,737,775	15,677	401,111	362,873	420,983	437,107	374,883	534,270	548,153	539,092	531,908	539,838	507,675	539,876
CLARK COUNTY—														
Morrison	19,016	52	1,519	1,740	1,550	1,740	1,550	1,800	1,550	1,829	1,200	1,767	1,176	1,595
ELLSWORTH COUNTY—														
Stoltenberg-Wilkins	1,041,658	2,846	42,501	40,859	48,391	47,829	58,280	87,433	79,792	102,747	141,066	144,385	126,173	122,202
Lorraine	534,696	1,461	49,538	47,763	49,507	48,360	48,484	46,066	47,666	46,157	45,696	35,195	36,939	33,325
Total	1,576,354	4,307	92,039	88,622	97,898	96,189	106,764	133,499	127,458	148,904	186,762	179,580	163,112	155,527
FINNEY COUNTY—														
Nunn	33,797	92	3,036	3,493	2,547	3,156	2,928	2,518	2,418	3,211	1,601	3,265	2,715	2,909
GRAHAM COUNTY—														
Morel	87,917	240	.....	3,104	7,677	8,690	12,806	10,987	9,482	10,401	8,964	6,986	2,922	5,898
HARVEY COUNTY—														
Halstead-Sperling	174,880	478	18,321	16,037	15,934	13,720	15,066	13,423	13,921	13,875	15,956	14,257	10,573	13,797
Hollow-Nikkel	511,007	1,396	41,199	40,861	42,067	34,676	38,502	35,253	43,338	48,236	42,390	53,010	41,100	50,375
Total	685,887	1,874	59,520	56,898	58,001	48,396	53,768	48,676	57,259	62,111	58,346	67,358	51,673	64,172
KINGMAN COUNTY—														
Cunningham	287,385	785	28,024	25,578	26,939	18,110	18,569	22,083	24,167	21,746	27,436	25,559	24,123	24,961
McPHERSON COUNTY—														
Bornholdt-Welch	1,035,648	2,829	27,280	37,091	44,826	43,500	60,419	67,173	88,380	110,616	137,046	154,304	125,829	139,184
Chindberg	95,576	261	8,804	7,163	8,308	7,560	9,021	7,710	7,534	8,618	7,200	8,029	7,743	7,886
Graber-Hesston	946,986	2,587	92,845	87,754	90,117	77,719	81,189	69,851	68,434	72,077	77,817	76,782	72,576	79,825
Johnson	82,985	227	6,882	4,872	5,735	6,201	6,820	7,132	7,443	7,746	7,248	7,685	7,530	7,691
Ritz-Canton	1,372,746	3,751	115,320	113,390	133,176	121,158	113,584	104,575	102,383	117,874	111,236	119,535	101,010	119,505
Roxbury	117,473	321	2,108	4,466	6,355	4,284	5,983	8,654	8,808	10,816	11,253	16,979	18,127	19,640
Voshell	562,389	1,537	45,260	42,891	46,655	38,485	40,734	41,291	48,101	50,674	54,924	49,393	48,181	55,800
Miscellaneous	103,858	.....	7,812	7,946	10,540	9,167	8,742	10,058	9,137	8,471	8,840	8,573	5,886	8,686
Total	4,317,661	11,797	306,311	305,573	345,712	308,074	326,492	316,444	340,220	386,892	415,564	441,280	386,876	438,217
NESS COUNTY—														
Aldrich	124,147	339	8,401	15,312	17,980	12,949	12,214	8,864	10,402	7,527	7,422	7,142	7,867	8,067
PAWNEE COUNTY—														
Pawnee Rock	51,471	141	2,232	3,654	4,650	2,939	3,596	5,068	4,426	4,237	5,313	5,761	4,504	5,091
PHILLIPS COUNTY—														
Miscellaneous	3,769	10	.....	.....	.....	756	.....	562	380	408	.....	614	588	461
PRATT COUNTY—														
Miscellaneous	43,814	120	2,827	2,354	2,464	2,115	2,597	2,663	4,163	5,635	4,534	4,900	4,654	4,908
RENO COUNTY—														
Buhler	75,701	207	9,201	9,831	7,750	7,520	5,580	5,356	5,520	4,346	5,243	5,153	4,808	5,393
Burrton	2,624,896	7,172	245,520	230,057	240,250	205,261	205,840	199,502	217,418	218,446	216,464	215,198	206,190	224,750
Hilger	254,509	695	21,886	18,763	22,196	19,417	20,460	22,564	21,291	19,686	22,682	21,710	21,211	22,643
Lerado	271,216	741	30,380	27,579	28,396	18,228	18,476	16,512	18,409	19,134	25,075	23,261	22,532	23,234
Miscellaneous	33,101	.....	4,557	2,552	3,131	2,708	2,728	2,669	2,177	2,188	2,574	2,300	2,731	2,786
Total	3,259,423	8,905	311,544	288,782	301,713	253,134	253,084	246,603	264,815	263,800	272,038	267,622	257,472	278,806
RICE COUNTY—														
Chase-Campbell-Keesling	2,330,452	6,367	227,988	215,789	223,541	158,645	166,222	172,432	184,096	177,684	179,734	212,788	201,559	209,974
Geneseo-Edwards	1,834,082	5,011	206,615	164,662	162,409	121,468	127,844	129,900	151,668	141,386	149,037	156,785	160,206	162,102
Hafferman	78,916	216	7,626	7,163	8,060	5,913	6,386	6,298	5,833	6,143	6,804	6,308	6,003	6,379
Orth and E. Orth	85,335	233	7,161	7,424	7,595	7,092	8,029	7,419	6,588	6,996	6,384	7,018	6,486	7,143
Ploog-Richard	76,927	210	7,068	6,467	6,697	5,588	5,797	5,486	6,166	6,287	7,805	6,334	6,413	6,819
Wherry and E. Wherry	1,354,745	3,701	123,659	125,019	125,457	108,713	110,267	112,491	104,883	112,464	111,927	109,722	99,216	110,927
Miscellaneous	56,626	.....	3,906	4,205	4,743	4,154	4,619	3,786	4,466	4,823	4,095	4,526	6,773	6,530
Total	5,817,083	15,894	584,023	530,729	538,502	411,573	429,164	437,812	463,700	455,783	465,786	503,481	486,656	509,874
RUSH COUNTY—														
Otis-Albert	391,786	1,070	44,299	36,366	34,627	26,912	28,334	28,968	34,390	32,814	32,650	35,376	28,600	28,450
ROOKS COUNTY—														
Laton	194,102	530	9,090	11,716	8,114	13,380	8,702	7,195	12,680	24,442	25,622	23,021	24,332	25,808
Miscellaneous	118,852	.....	7,319	14,108	9,631	10,930	10,403	9,314	10,666	10,187	9,948	9,015	7,783	9,548
Total	312,954	855	16,409	25,824	17,745	24,310	19,105	16,509	23,346	34,629	35,570	32,036	32,115	35,356
RUSSELL COUNTY—														
Atherton-Russell	630,847	1,724	47,864	47,502	50,034	49,623	48,050	55,823	53,039	53,792	58,535	56,720	53,032	56,833
Big Creek-Vaughn	583,416	1,594	47,585	46,748	55,211	43,626	44,268	42,847	46,168	48,153	53,821	52,476	49,861	52,652
Fairport	635,434	1,736	48,112	49,474	54,064	53,520	54,591	52,050	57,288	51,956	53,250	55,211	47,706	58,212
Gorham	2,176,114	5,946	220,008	177,110	189,636	153,296	184,887	176,427	177,475	178,529	182,942	178,270	177,107	180,427
Greenvale and N. Greenvale	90,265	248	5,239	5,858	7,967	5,498	6,758	6,879	6,639	6,989	7,483	10,015	10,145	10,795
Hall-Gurney	2,242,762	6,128	152,434	163,908	197,284	150,228	163,029	174,660	195,558	179,687	206,414	210,626	220,520	228,414
Trapp-Sellens	5,537,627	15,130	455,569	439,118	477,276	379,102	420,546	445,165	463,780	443,555	505,910	502,547	499,279	505,780
Miscellaneous	593,000	.....	3,968	4,176	4,092	4,407	5,760	4,110	4,305	5,642	4,514	4,740	6,643	6,943
Total	11,955,765	32,666	980,779	933,894	1,035,564	839,300	927,889	957,961	1,004,252	998,303	1,072,869	1,070,605	1,064,293	1,100,056
SCOTT COUNTY—														
Shallow Water	158,672	434	13,573	12,441	13,764	12,688	14,942	14,763	15,254	12,938	12,495	10,238	12,338	13,238
SEDGWICK COUNTY—														
Eastborough	186,547	510	16,647	16,037	15,345	16,950	17,267	15,150	17,949	14,849	14,490	14,508	13,336	14,019
Goodrich	237,576	649	22,289	20,126	22,909	18,132	19,096	16,901	18,903	19,029	20,522	20,111	19,231	20,327
Greenwich	249,720	682	21,421	21,953	21,731	19,842	19,840	20,272	20,924	20,378	20,197	21,208	20,640	21,314
Robbins	98,363	269	10,292	9,106	8,277	9,750	8,091	7,860	8,711	7,502	7,950	6,494	7,232	7,098
Valley Center	368,324	1,006	29,357	27,521	29,481	28,480	31,713	34,650	31,961	32,612	30,150	31,434	29,432	31,533
Miscellaneous	15,958	.....	1,829	1,281	1,519	1,440	1,550	1,320	1,178	1,581	1,440	1,240	780	800
Total	1,156,488	3,160	101,835	96,024	99,262	94,594	97,557	96,153	99,626	95,951	94,749	94,995	90,651	95,091
STAFFORD COUNTY—														
Drach-Fisher-Gates	199,704	545	14,446	13,891	14,756	15,042	16,182	21,647	19,535	14,882	17,626	16,238	17,769	17,640
Leesburgh	125,531	343	3,534	3,654	.....	6,812	7,781	20,915	26,566	16,432	11,466	8,155	10,020	10,196
Richardson	498,189	1,361	40,486	28,072	36,983	31,402	33,077	56,230	63,331	41,667	46,850	40,424	38,853	40,814
Sittner-Max	208,428	569	9,621	9,106	11,377	10,493	13,671	20,756	23,591	20,532	21,864	22,735	22,139	22,543
Snider and S. Snider	66,361	181	2,014	4,205	4,402	2,991	3,224	3,839	6,520	7,394	7,685	6,519	8,282	8,386
St. John-McNaughton	174,570	477	16,027	11,832	12,368	13,280	13,981	19,870	19,868	13,006	14,624	13,263	12,990	13,460
Zenith	1,835,206	5,022	129,859	108,779	123,938	116,625	128,495	145,099	180,863	196,169	185,275	171,683	174,219	177,202
Miscellaneous	87,173	.....	4,588	5,220	4,960	4,625	4,619	4,190	5,011	6,461	9,332	12,384	12,811	12,962
Total	3,198,162	8,738	221,475	184,759	208,785	201,270	221,030	292,546	345,335	316,543	314,722	291,411	297,083	303,203
SUMNER COUNTY—														
Churchill	179,185	490	15,562	14,297	13,640	15,690	16,089	14,310	15,562	15,500	13,980	15,624	13,081	15,850
Latta	88,727	242	5,425	6,670	7,502	6,645	6,758	8,300	9,539	7,572	7,196	7,902	7,290	7,928
Oxford	238,260	651	20,150	20,706	19,871	21,540	22,909	19,500	22,754	7,564	20,700	20,832	20,826	20,908
Wellington	507,306	1,386	50,220	46,690	41,819	45,183	52,886	41,727	40,238	40,959	37,800	37,831	34,381	37,572
Miscellaneous	206,160	.....	14,756	16,762	19,189	17,831	18,042	18,085	18,377	17,141	16,436	16,826	16,032	16,683
Total	1,219,638	3,332	106,113	105,125	102,021	106,889	116,684	101,922	106,470	88,736	96,112	99,015	91,610	98,941

(Continued on Page 145)

KANSAS CRUDE-OIL PRODUCTION—(Continued)

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
TREGO COUNTY—														
Miscellaneous	47,893	131	5,456	5,075	3,751	4,170	4,278	3,720	4,805	3,503	4,050	3,958	2,340	2,787
BUTLER COUNTY—														
Augusta	425,043	1,161	33,511	33,611	36,394	34,230	36,022	34,140	38,130	37,479	35,520	35,836	34,234	35,936
Blankenship	84,458	231	6,448	6,119	5,735	7,200	7,905	6,450	8,432	7,378	6,210	8,370	6,362	7,849
Brandt	215,216	588	13,020	12,760	19,499	19,530	21,638	18,780	20,148	17,373	17,176	20,092	15,758	19,442
Douglas	48,455	132	1,860	1,450	2,170	2,010	2,294	1,980	4,433	5,239	4,770	6,448	7,773	8,028
Elbing	399,746	1,092	30,008	34,133	34,131	31,860	33,759	31,770	35,154	33,449	32,974	36,363	32,014	34,131
El Dorado	2,651,409	7,244	209,591	214,745	228,966	219,360	228,935	219,150	231,446	226,672	215,970	223,014	207,006	226,554
Fox-Bush	130,922	358	9,424	10,614	11,098	11,310	10,881	11,010	12,183	11,377	11,070	11,036	9,786	11,133
Leon-Weaver	446,836	1,221	31,372	35,322	37,324	35,010	38,688	34,920	38,175	37,727	38,550	40,214	39,147	40,387
Potwin	249,915	683	19,096	20,996	21,018	20,340	20,739	20,070	30,615	19,733	19,920	19,809	17,550	20,029
Young	82,062	224	6,262	7,337	7,595	7,380	7,533	7,320	7,192	6,851	6,210	6,448	5,670	6,264
Miscellaneous	311,050	.....	18,786	23,113	21,235	21,486	22,156	21,075	29,585	30,718	30,075	32,291	27,812	32,718
Total	5,045,112	13,784	393,296	400,200	425,165	409,716	430,550	406,665	455,493	433,996	418,445	439,921	403,112	442,471
COFFEY COUNTY—														
Miscellaneous	34,875	95	992	2,378	1,860	1,590	1,302	1,650	2,542	1,736	1,740	1,818	1,500	1,899
COWLEY COUNTY—														
Couch	34,232	94	186	638	403	420	403	2,144	2,966	2,801	4,671	6,928	5,828	6,844
David and S. David	90,089	246	6,324	6,641	5,022	4,890	6,882	4,710	7,595	8,742	7,980	8,618	10,020	12,665
Frog Hollow	177,469	485	23,095	12,789	14,167	11,520	12,741	13,814	14,446	14,569	15,014	14,760	15,163	15,391
Hittle	840,801	2,297	85,498	77,836	79,515	64,230	52,266	45,702	48,794	94,581	89,700	67,921	65,730	69,028
Rainbow Bend	388,481	1,061	32,581	31,842	33,077	33,330	33,728	32,910	31,713	33,852	31,080	31,806	30,786	31,776
Rock	189,879	519	11,842	11,020	11,687	12,630	12,710	11,580	18,955	17,143	17,460	20,022	21,339	23,491
Weathered	193,033	527	21,142	19,517	19,592	16,090	16,957	13,478	10,635	14,579	15,079	15,569	14,777	15,618
Winfield-State	214,568	586	17,329	18,444	18,755	17,520	17,856	17,220	17,856	18,600	18,690	18,042	16,142	18,114
Miscellaneous	542,378	.....	46,686	51,330	49,879	45,343	46,407	44,252	45,506	47,004	43,457	42,409	38,156	41,949
Total	2,670,930	7,298	244,683	230,057	262,097	205,973	199,950	185,810	198,466	251,871	243,131	226,075	217,941	234,876
ELK COUNTY—														
Miscellaneous	303,436	829	17,298	20,793	17,577	14,640	19,003	15,420	23,405	28,396	27,150	41,447	35,820	42,487
GREENWOOD AND WOODSON COUNTIES—														
Atyeo-Pixley	617,689	1,688	42,284	37,787	54,963	48,180	54,808	48,330	56,141	56,792	52,410	58,249	51,333	56,412
Sallyards	479,601	1,310	33,604	34,684	36,425	38,100	42,346	36,360	42,346	42,749	40,770	46,190	40,029	45,998
Virgil and N. Virgil	560,157	1,530	35,898	45,791	47,616	47,280	52,111	46,860	50,398	48,670	44,340	49,693	42,360	49,140
Dunaway	69,628	190	4,247	5,568	5,952	5,910	6,603	5,610	6,727	6,231	5,940	5,890	5,280	5,670
Lamont	126,501	346	9,083	10,933	10,354	10,830	10,757	10,710	10,478	10,292	10,680	10,664	10,740	10,980
Quincy	204,811	560	15,252	18,009	19,313	15,780	15,996	16,320	20,150	18,972	17,700	17,453	13,350	16,516
Winterscheid	230,026	628	14,880	20,851	19,251	19,110	20,429	19,170	20,553	19,282	19,050	19,747	17,940	19,763
Seeley-Wick	794,927	2,172	58,435	68,092	65,565	67,110	69,502	66,780	72,788	67,797	64,920	66,278	61,746	65,914
Beaumont	77,629	212	2,046	3,248	2,418	4,530	6,820	3,390	6,696	7,874	9,690	10,571	9,300	11,046
Miscellaneous	264,057	....	15,190	24,418	23,622	20,940	23,316	21,000	25,482	22,092	21,300	24,087	19,681	22,929
Total	3,425,026	9,358	230,919	269,381	285,479	277,770	302,688	274,530	311,759	300,751	286,800	308,822	271,759	304,368
MARION COUNTY—														
Lost Springs	369,574	1,010	24,366	10,730	32,988	37,230	49,144	32,100	28,526	25,793	28,712	31,694	33,998	34,293
Miscellaneous	177,812	.....	9,641	16,530	16,306	14,580	15,779	14,310	14,477	16,337	15,630	15,252	13,620	15,350
Total	547,386	1,496	34,007	27,260	49,294	51,810	64,923	46,410	43,003	42,130	44,342	46,946	47,618	49,643
EASTERN COUNTIES—														
Miscellaneous	3,100,565	8,471	187,333	239,743	260,679	230,250	249,860	238,650	276,799	294,221	283,309	294,438	261,600	283,683
Total	64,944,904	177,445	5,208,651	5,034,740	5,402,163	4,708,267	4,975,365	5,162,674	5,595,196	5,632,767	5,807,904	5,890,966	5,608,705	5,918,116
Daily average	177,445	.....	168,021	173,611	174,263	156,942	160,455	172,089	180,490	181,702	193,597	190,031	186,957	190,906

earlier in the year Simpson production was discovered in the Snider pool and the Snider, South Snider and Max pools were extended. All of this work was classed as development and exploration along the southwest flank of the Barton arch, running far to the southwest.

Eastern Counties

The southeastern part of the state, generally referred to as "eastern shallow," also had a busy year, featured by increased water-flooding activity in addition to new drilling.

Development of the Kansas sector of the Forest City basin proved somewhat of a disappointment with six dry holes drilled. Several wildcats were started following the discovery of oil near Falls City, in southeastern Nebraska, in spite of the failure of numerous basin tests in both Missouri and Kansas previously. However, an oil and gas pool was opened nearby in Jefferson County, and oil was found in shallow zones in Johnson County on the south flank of the basin in 1939, and some exploration may be expected to continue.

Secondary Recovery

During the year Kansas added considerably to its water-flood projects. Production from the principal water-flood projects in the state reached more than 3,500 bbl. daily and was obtained from the shoestring-sand pools which have been producing for as long as 50 years. Much of the year's new water flooding was undertaken in the fields of Miami and Greenwood counties.

Summary of Activity

Throughout the state, wildcat exploration was not as widespread as in 1939, nor was the percentage of discovery as high. Even so, there were 39 discoveries of oil in new pools or new horizons in old pools, and a number of gas discoveries. Also, preliminary activity, leasing and geophysical and geological exploration increased in the northwestern part of the state, and it was apparent that many important tests will be drilled during 1941.

The increase in field activity last year, which became evident in early spring, was confined largely to extension tests near proven areas as described above.

Russell County was the most active in the state throughout the year with a total of 282 completed wells of which 259 were oil wells and 23 were dry holes. The campaign resulted in combining several fields into Hall and Gurney, which were themselves joined, and also into Gorham and Trapp.

Barton County includes part of the Trapp field and claimed second place in the number of wells drilled because of the activity there and in Silica and Bloomer as well as development of lesser pools. Altogether there were 252 wells drilled in the county, of which 200 were oil wells and seven were gas wells. Forty-five were dry holes.

The next busiest county was Ellis, western neighbor to Russell, where the Bemis-Shutts pools accounted for the bulk of the drilling. Of the 201 wells drilled, 175 were oil wells and 26 were dry holes. Ellsworth County had 139 oil wells out of a total of 167 drilled, and McPherson had 149 oil wells and 5 gas wells out of 163 drilled.

Completions in other active counties were Stafford, 117; Greenwood, 83, and Butler, 75. Rooks County, although it had only 38 completions, 29 of which were oil wells, seemed due to take its place in the near future with the leading sections of the state as the play creeps northwest along the Barton arch.

Field Developments in 1940

	No. wells Jan. 1, 1940	No. wells Dec. 31, 1940
Barber:		
Whelan	9	14
Barton:		
Ainsworth	58	58
Kraft & N.	36	48
Clark:		
Morrison	2	2
Ellis:		
Blue Hill	7	14
Ruder	14	12
Solomon	3	3
Finney:		
Nunn	2	2
Graham:		
Morel	5	6
Harvey:		
Hollow-Nikkel	114	109
Kingman:		
Cunningham	47	54
McPherson:		
Chindberg	31	31
Graber-Hesston	126	136
Johnson	16	16
Ritz-Canton	265	264
Roxbury	6	25
Voshell	105	102
Ness:		
Aldrich	11	13
Pawnee:		
Pawnee Rock	7	9
Phillips:		
Bow Creek	1	2
Reno:		
Buhler	10	10
Burrton	455	442
Higer	34	33
Lerado	33	33
Rice:		
Hafferman	9	10
Orth & E.	11	14
Wherry & E.	197	211
Rooks:		
Laton	13	36
Russell:		
Fairport	145	144
Gorham & E.	299	305
Greenvale & N.	8	13
Scott:		
Shallow Water	8	8
Sedgwick:		
Eastborough	47	46
Goodrich	34	34
Greenwich	42	42
Robbins	51	52
Valley Center	70	67
Stafford:		
Leesburg	7	9
Richardson	59	60
Snider & S.	5	13
St. John-McNaughton	19	19
Zenith	162	226
Sumner:		
Churchill	67	63
Latta	11	11
Oxford & W.	52	48
Wellington	98	98
Trego:		
Miscellaneous	13	8
Butler:		
Augusta & N. & S.	216	210
Blankenship	90	88
Brandt	90	88
Elbing	89	75
El Dorado	1,649	1,627
Fox-Bush	164	153
Cowley:		
Couch	1	9
David & S.	22	27
Frog Hollow	19	24
Hittle	69	72
Rock & E & N.	34	40
Weathered	31	29
Elk:		
Miscellaneous	261	281
Greenwood-Woodson:		
Virgil & N.	424	412
Dunaway	60	60
Lamont	108	108
Quincy	115	115
Winterscheid	225	227
Beaumont	9	13
Marion:		
Lost Springs	61	74
Miscellaneous	90	85
Prorated	5,520	6,617
Nonprorated	14,057	14,056
Total Kansas	19,577	20,673

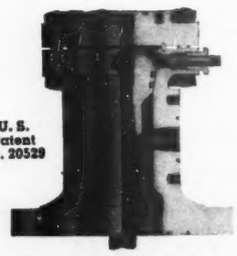
Miscellaneous Field Production

Total and daily average production for fields which were grouped under a single heading in the production table for Kansas are shown below in addition to the number of wells producing at the beginning and the end of 1940. Areas for which production is given in the complete table are indicated in the table of field developments.

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Barber County:				
Lake City	15,096	41	2	2
Medicine Lodge	18,090	49	2	2
Barton County:				
Beaver-Feltes:				
Beaver and N.	192,495	525	24	25
Feltes	55,092	150	1	7
Bloomer-Stumps, etc.:				
Bloomer-Stumps	1,651,896	4,513	167	201
Breford	125,694	343	17	18
Heinz	6,857	18	2	2
Prusa-Krier:				
Prusa	296,790	811	17	31
Prusa W.	43,877	119	4	7
Krier	79,254	216	1	13
Hartzman	16,937	46	1	1
Silica-Raymond:				
Silica	5,417,776	14,802	639	723
Raymond	276,993	756	38	41
Wenke and E.	65,030	177	9	9
Miscellaneous:				
Davidson	9,452	25	2	1
Feist	4,748	12	1	1
Heizer	3,550	10	1	1
Hiss	30,045	82	4	4
Hoisington	29,004	79	2	3
Kruckenburg	1,972	5	2	1

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Lanterman	44,729	122	6	6
Eberhardt	22,824	62	4	4
Rick	31,590	86	5	5
Pospishel	8,555	23	2	2
Wondra	351	11	0	1
Ellis County:				
Bemis-Walters:				
Bemis-Shutts-Cress	2,912,011	7,956	317	372
Hadley	1,423	3	1	1
Kobletz	40,899	111	3	4
Marshall	115,433	315	13	15
Walters	349,718	955	31	41
Burnett:				
Burnett	1,755,315	4,795	52	132
Haller	1,283	3	1	1
Richards	14,697	40	2	2
Miscellaneous:				
Catherine	19,290	52	4	4
Emmeram	7,731	21	1	1
Kraus	6,878	18	2	2
Penny Wann	6,780	18	1	1
Toulon	32,252	88	5	4
Ubert	25,373	69	4	4
Hartzook	4,684	12	1	1
Ellsworth County:				
Stoltenberg-Wilkins:				
Stoltenberg	510,430	1,394	22	98
Heiken	17,087	46	5	4
Stratman	169,023	461	17	31
Wilkins	359,478	982	19	42
Harvey County:				
Halstead-Sperling:				
Halstead	134,156	366	21	21
Sperling	45,834	125	7	7
McPherson County:				
Bornholdt-Welch:				
Bornholdt and N.	917,851	2,507	13	140
Welch and N.	110,777	302	31	32
Miscellaneous:				
Canton N.	7,602	20	1	1
Lindsborg	30,790	84	2	2
McPherson	65,456	178	29	28
Pratt County:				
Miscellaneous:				
Cairo	9,356	25	1	4
Iuka	34,444	94	3	5
Reno County:				
Miscellaneous:				
Yoder	7,356	20	2	2
Abbyville	25,849	70	6	6
Rice County:				
Chase-Campbell:				
Chase	1,687,805	4,610	249	259
Campbell	280,805	767	18	25
Doran	45,047	123	3	3
Keesling	275,321	752	45	46
Midway	49,310	134	6	6
Geneseo-Edwards:				
Geneseo	1,317,861	3,600	144	155
Edwards	496,221	1,355	54	68
Ploog-Rickard:				
Ploog	69,609	190	10	10
Rickard	7,007	19	1	1
Miscellaneous:				
Brandenstein	15,956	43	2	2
Brefeldt and W.	22,194	60	1	2
Guldner	12,991	35	3	3
Karber	7,127	19	1	1
Lyons	6,419	17	1	1
Ponce	5,159	14	1	1
Rooks County:				
Miscellaneous:				
Dopita	29,178	79	5	5
Westhusin	71,849	196	9	11
Zurich	15,972	43	4	4
Rush County:				
Otis-Albert:				
Otis	303,121	827	19	19
Albert	88,765	242	14	14
Russell County:				
Atherton-Russell:				
Atherton and N.	266,568	728	21	38
Russell	355,116	970	49	49
Big Creek-Vaughn:				
Big Creek	281,226	768	40	49
Big Creek E.	59,272	161		
Neidenthal	48,659	132	14	10
Vaughn	203,167	.....	27	27
Hall-Gurney:				
Gurney and S.	910,614	555	70	125
Hall	1,449,368	3,960	121	176
Williamson and Michel	18,164	49	2	2
Trapp-Sellens:				
Anschutz	41,746	114	6	13
Eichman	36,791	100	9	9
Fairfield and N.	57,321	156	5	9
Karst	28,670	78	5	5
Sellens	171,490	468	25	26
Trapp and W.	5,186,683	14,171	539	672
Miscellaneous:				
Boxberger	10,596	28	4	4
Bunker Hill	10,684	28	4	4
Donovan	5,820	15	1	1
Dubuque	14,708	40	2	2
Gideon	3,374	9	1	1
Mahoney (2 mos.)	4,664	25	0	1
Steinert	3,673	10	1	1
Driscoll (5 mos.)	4,994	13	0	1
Sedgwick County:				
Miscellaneous:				
Cross	12,604	34	2	2
Kuske	1,772	4	1	1
Oatville	1,577	4	1	1
Stafford County:				
Drach-Fischer-Gates:				
Drach	71,649	195	9	9
Fischer	39,563	108	5	5
Gates	88,382	241	11	11
Sutter-Max:				
Sutter and S.	164,697	449	67	67
Max	44,340	121	3	5
Miscellaneous:				
Jordan	31,956	87	4	5
Kipp	22,593	61	2	3
Rattlesnake	8,652	23	1	1
Sumner County:				
Miscellaneous:				
Annesse	7,798	21	1	1
Caldwell	61,117	166	4	4
Padgett	73,244	200	20	20
Rutter	7,219	19	1	1
Vernon N.	34,591	94	5	5
Zyba	7,130	19	1	1
Udall	2,492	6	1	1
Butler County:				
Leon-Weaver:				
Garden	64,805	177	30	30
Haverhill	99,284	271	61	63
Kramer	44,518	121	19	17
Leon	26,787	73	22	21
Reynolds-Schaffer	113,301	309	27	25
Stern	95,402	260	16	16
Weaver	2,738	7	8	5
Miscellaneous:				
Bausinger	9,027	24	5	5
Benton	4,802	13	2	2
Gilwick	12,432	33	2	2
Keighly	49,987	136	51	52
McCaig	3,478	9	2	2
McCullough	53,103	145	8	8
Moore	7,009	19	3	3
Pierce	4,203	11	3	2
Seward	16,754	45	14	41
Smock-Sluss	58,713	160	42	41
Snowden-McSweeney	3,767	10	1	1
Steinhoff	3,115	17	3	3
Others	57,983	158	13	19
Coffey County:				
Van Noy	34,875	95	36	36
Cowley County:				
Winfield-State:				
State	70,360	192	32	32
Winfield	104,074	284	63	62
Biddle and W.	40,134	109	23	23
Rainbow Bend:				
Rainbow Bend and W.	353,805	966	118	118
Geuda Springs	34,645	94	11	11
Miscellaneous:				
Baird	4,480	12	4	2
Brown	2,585	7	1	1
Burden	59,202	161	33	33
Clark	14,834	.....	4	4
Countryman	10,084	40	5	5
Darien	44,781	122	6	6
Dexter	3,037	8	1	1
Dunbar	1,025	2	1	1
Eastman	45,659	124	33	33
Falls City	15,346	41	13	8
Ferguson, W.	39,081	106	5	10
Graham	28,262	77	15	13
Grand Summit	29,049	79	14	14
Hanna	6,095	16	2	2
Mahanna	12,137	33	2	2
Murphy	33,064	90	12	12
Olson	4,924	13	7	6
Rahn	6,735	18	1	1
Reidy	2,456	6	3	3
Slick-Carson	61,919	169	17	18
Smith	9,209	25	12	12
Thurlow	4,125	11	1	1
Trees	53,438	146	10	10
Turner	29,671	81	6	6

(Continued on Page 159)



U. S. Patent No. 20529

Cross-section view of an all-flanged O-C-T Type T-16 Tubing Head. Tubing is suspended from a threaded type hanger which is forced into sealing position by lock-down set screws in the top flange. This head permits drilling-in and running and landing tubing through blowout preventer equipment.

O-C-T Christmas Trees, like the one pictured above on an input well of the Lone Star Gasoline Company-Trinity Gas Corporation recycling plant, are a familiar sight in the Grapeland (Texas) field. The O-C-T Type T-16 Tubing Head, shown in cross-section at left, provides the foundation for most of the O-C-T trees in this high pressure field.

Complete mechanical details on all types of O-C-T Casing Heads and Tubing Heads are provided in the new O-C-T Bulletin No. 240. Write for a copy.

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DISCOVERIES IN HAWKINS AND CHAPEL HILL REVIVE EAST TEXAS AREA

By R. MARNE SANFORD

PROVIDING more excitement and a greater play than any discovery in several years the eastern Texas district started the year off well with the discovery of the deep Pettit lime Chapel Hill field in Smith County. Development continued through the summer in this field with the addition of two new pay levels, and sufficient new production to mark the year as one of the most profitable in several years. This appeared to be the only discovery of any importance until the last month of 1940 when two oil discoveries in Wood County literally blew the lid off of the district and started the wildest scramble for leases since the early days of the East Texas field. As the year closed, both discoveries in Wood County had been gaged and the play radiating from these Woodbine sand strikes had pushed outward in all directions to include some four or five counties.

Even in view of the fact that apparently a major Woodbine sand oil field has been discovered at Hawkins in Wood County, another feature bid strong to overshadow its development, that of new wildcatting on known structures throughout the district as started by and resulting from the Hawkins discovery. There were no less than nine new tests being planned or already started on known structures in the area at the close of the year. These included the Red Springs prospect in northern Smith County and the Winona and Sand Flats prospect, also in northern Smith County, the Frankston townsite test in Anderson County, the Ore City prospect in Upshur County, where Sun Oil Co. is planning a test, the Henderson area in Rusk County where a deep 8,500-ft. test is starting, the Mount Enterprise prospect in Rusk County where Skelly Oil Co. is preparing to start a test, the Haynesville dome in northwestern Wood County where Sells Petroleum Co. and Delta Drilling Co. are preparing to proceed with their deep wildcat which was shut down to await the results of the Hawkins discovery, the Alba prospect in Rains County where a deep Trinity series wildcat is preparing to start, and the Keechi dome prospect in Anderson County where Texas Co. has already started a test. All of these known structures are being tested as a result of the discovery of Woodbine sand oil at Hawkins in Wood County.

The Hawkins play started with Manziel 1 Morrison and was augmented by the townsite discovery in Hawkins 2 weeks later at the Jackson & Rotondi 1 Cobb, George Brewer Survey. Perhaps the two discoveries alone would not have created so much excitement had not each of the early tests in the area found structural markers higher than its predecessors. The well following the Morrison discovery was Manziel 1 Bell, the wildcat gasser which was later plugged. It checked higher than 1 Morrison and then the Rotondi townsite discovery came in checking several hundred feet higher than either of the two other wells. Immediately following this last discovery the leasing play started south and before many days had reached the city limits of Tyler in central Smith County.

As the year closed there were insufficient tests drilled in the area to attempt to determine which way the field would likely run; however, two old outlying failures did tend to limit it in two directions. About 1½ miles southeast of Hawkins there is a deep

Field Developments in 1940

East Central Texas

	No. wells Jan. 1	No. wells Dec. 31		No. wells Jan. 1	No. wells Dec. 31
Bazette	1	31			
Corsicana	3	5	Baker	1	31
Flag Lake	608	630	Sulphur Bluff	2	3
Mexia	14	16	Van	73	73
Powell	235	217		588	588
Rowe &	156	145			
			Total	1,754	1,759

Miscellaneous Fields

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Bolivar	5,052	14	2	2
Collinsville	7,394	20	2	2
Currie	37,498	102	13	13
Lott	5,473	15	4	5
Negro Creek	116	1	1	0
Opelika	3,713	10	1	1
Pottsboro	1,295	4	2	2
Post Oak	853	4	2	1
Richland	7,695	21	2	3
South Bosque	4,860	14	36	39
Tehuacana	8,685	58	0	2
Wortham	35,459	97	10	12

DISCOVERIES IN EASTERN TEXAS DURING 1940

County, discovery well, location—	Date	Depth	Gage	Formation	No. wells	Name pool	Remarks
Smith, Shell 1 Campbell, P. Lively Sur., 2 mi. NE of distillate discovery of 2 years ago	Feb. 12	8,036-58	Flowed 1,025 bbl. daily	Pettit L. (Glen Rose) Trinity	2 oil 2 dis.	Chapel Hill	Both oil and distillate producing level.
Smith, Sun Oil 1 Everhart, P. Lively Sur., 1½ mi. SE of first oil discovery in Chapel Hill field	June 28	8,252-8,405	271 bbl. daily, naturally	Third and lowest break in Pettit L.	1 oil 2 dis.	.....	Producing from lowest break in Pettit lime of Glen Rose of Trinity.
Camp, H. S. Moss 1 Joe Venters, Wright Sur., 3 mi. SE of Leesburg	Aug. 29	8,000-42	84 bbl. daily	Pettit L. (Glen Rose) Trinity	1 oil	Pittsburg	
Smith, Sun-Shell 1 Mosely, Levi Hands Sur., north end of Chapel Hill field	Oct. 10	5,785-5,810	107 bbl. distillate daily	Lower Paluxy sand of Trinity	1 dis.		New shallower level for Chapel Hill field.
Wood, Bobby Manziel 1 Morrison, James Pollock Sur., 3 mi. N of Hawkins	Dec. 6	4,910-16	128 bbl. daily, pumping	Woodbine sand	1 oil	Morrison	
Wood, S. J. Rotondi and Jackson 1 Cobb heirs, George Brewer Sur. in townsite of Hawkins	Dec. 29	4,507-85	Flowed 363 bbl. in 3 hr.	Woodbine sand	1 oil	Hawkins	Just 3 miles south of Morrison discovery and may prove one large field.

EASTERN TEXAS CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

East Texas Field

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Joiner	41,373,453	113,042	3,676,284	3,478,306	3,678,423	3,686,772	3,495,498	3,070,190	3,747,820	3,408,050	3,211,500	3,385,225	3,240,085	3,295,300
Kilgore	42,727,659	116,742	3,995,852	3,573,232	3,778,811	3,787,388	3,590,761	3,165,620	3,851,130	3,501,050	3,304,140	3,472,395	3,326,360	3,380,920
Longview	55,042,719	150,390	4,714,309	4,667,821	4,936,382	4,947,586	4,675,199	4,123,993	4,843,772	4,527,538	4,368,241	4,553,105	4,306,426	4,378,347
Total	139,143,831	380,174	12,386,445	11,719,359	12,393,616	12,421,746	11,761,458	10,359,803	12,442,722	11,436,638	10,883,881	11,410,725	10,872,871	11,054,567
Daily average	380,174	.....	399,563	404,116	399,794	414,058	379,402	345,327	401,378	368,924	362,796	368,087	362,119	356,599

East Central Texas

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Bazzette	91,950	251	5,050	3,791	5,856	10,269	11,836	9,065	7,693	7,003	6,991	8,260	8,491	7,645
Corsicana	152,734	417	11,412	12,621	13,083	13,053	13,518	13,255	12,841	13,959	12,575	13,426	11,936	11,055
Flag Lake	124,242	339	9,722	10,143	13,191	6,876	14,590	10,592	10,000	9,942	11,089	11,055	8,908	8,134
Mexia	563,723	1,540	49,095	46,343	49,398	47,721	48,654	45,869	48,092	47,832	46,202	47,594	45,416	41,507
Powell	627,091	1,713	54,401	51,704	54,766	53,335	54,019	52,227	52,635	53,258	51,228	52,240	50,444	46,834
Rowe and Baker	46,367	127	738	1,021	2,012	1,684	2,230	3,374	5,510	7,261	5,272	6,039	5,096	6,130
Sulphur Bluff	1,507,273	4,118	131,406	74,913	137,049	128,539	132,566	119,549	127,855	135,599	131,311	134,373	130,685	123,428
Van	4,418,445	12,072	429,933	401,932	523,863	459,826	428,319	327,792	296,567	273,364	261,650	327,974	364,865	322,360
Miscellaneous	118,093	....	9,040	9,180	9,645	9,831	9,622	10,265	10,687	8,768	7,946	11,235	11,328	10,546
Total district	7,649,918	....	700,797	611,648	808,863	731,134	715,354	591,988	571,880	556,986	434,264	612,196	637,169	577,639
Daily average	20,901	....	22,606	21,091	26,092	24,371	23,076	19,733	18,448	17,967	17,809	19,748	21,239	18,634

East Texas Border

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Boggy Creek	89,362	244	9,662	8,300	8,220	7,581	9,018	6,528	7,346	6,728	5,777	7,370	6,700	6,132
Cayuga	3,823,775	10,447	314,838	224,983	285,944	278,628	351,914	314,279	312,652	355,414	346,154	366,279	353,777	318,913
Chapel Hill	35,501	116	....	....	4,883	3,636	2,631	2,059	1,835	3,567	2,986	5,833	4,257	3,814
Long Lake	651,016	1,779	65,750	63,863	69,894	67,484	65,955	49,500	45,145	46,901	43,280	47,105	44,624	41,515
Marion County	114,355	312	3,318	3,955	7,203	8,189	8,282	9,264	12,558	12,177	12,932	13,238	11,889	11,350
Navarro Crossing	189,071	517	20,153	19,504	21,448	20,382	19,202	15,289	13,586	12,518	11,828	12,530	11,951	10,680
Rodessa	6,402,198	....	748,155	642,564	657,066	607,914	598,004	488,024	447,798	412,336	498,465	509,695	405,855	386,322
Talco	8,720,798	17,492	659,126	620,439	767,923	717,819	744,249	677,050	727,247	776,405	760,083	792,537	769,594	708,326
Trinity	119,165	326	11,214	10,754	11,609	10,863	9,642	7,936	7,037	6,525	10,279	13,711	10,150	9,445
Miscellaneous	119,990	....	9,387	10,159	10,813	10,302	10,064	8,894	9,905	10,564	9,872	11,247	9,164	9,619
Total	20,265,231	....	1,841,603	1,604,521	1,845,003	1,732,798	1,818,961	1,578,823	1,585,109	1,643,135	1,701,656	1,779,545	1,627,961	1,506,116
Daily average	55,369	....	59,407	55,328	59,516	57,760	58,676	52,627	51,133	53,004	56,722	57,405	54,265	48,584

failure which has been correlated several hundred feet lower than the townsite discovery. Likewise, 3 miles west of Hawkins is a 5,080-ft. Woodbine sand failure which tends to limit the field in that direction. Most speculation at the close of the year was that the field would have a north-south or a northeast-southwest trend from the original Morrison discovery well, south through the town of Hawkins and into northern Smith County.

Chapel Hill Discovery

In 1938 the first producing well, a distillate well, was drilled on the Chapel Hill structure in Smith County. Not until early February of the past year was the initial oil discovery drilled, Shell 1 Campbell, P. Lively Survey, about 2 miles northeast of the original distillate well. Production was found in the Pettit lime of the Glen Rose section of Trinity series and immediately development began on many short-term leases in the field. Early in June another oil zone was opened, from a lower break in the Pettit lime, and still later, in October, a shallow distillate-producing horizon was opened from the Paluxy sand at 5,700-5,800 ft. As the year closed there was a total of nine wells in the field, three oil wells and six distillate wells. Development will continue at a steady pace during the coming year and much of the now-only distillate proven acreage will undoubtedly become also productive for oil. The field is thought to be located over a deep-seated salt dome such as is productive in the Van field.

East Texas Field Work Holds Steady

Exceptions to spacing rules, together with small edge extensions, held drilling activity in the East Texas field at a steady pace as the year closed. The first half of the year saw weekly completions drop from about 10 to 12 per week to a low of from three to five per week. During the last half of the year this rate considerably picked up to a weekly average of from 8 to 10. Plugging permits still continued at almost the completion rate; however, the full-scale plugging due to salt water on the west side of the field have considerably subsided since the summer and fall months.

Field Developments in 1940

East Texas Border

	No. wells Jan. 1	No. wells Dec. 31		No. wells Jan. 1	No. wells Dec. 31
East Texas	26,234	25,922	Navarro		
Boggy Creek	19	18	Crossing	17	20
Cayuga	257	274	Rodessa	481	500
Chapel Hill	0	9	Talco	685	725
Long Lake	85	111	Trinity	22	22
Marion County	5	5	Total	27,888	27,687

Miscellaneous Fields

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Ginter	7,621	21	3	3
Grapeland	30,877	84	1	1
Huntington	1,843	5	4	5
Lone Star	7,282	30	2	0
Nacogdoches	2,727	7	20	20
Panola	7,329	20	4	3
Percilla	5,676	16	1	0
Potter	22,801	62	28	28
Pittsburgh	11,471	76	0	1
Shelbyville	2,347	12	1	0
Waskom	20,016	55	20	20

Completions by Months

Month—	Comp.	Prod.	Dry	Gas
January	51	2,490	8	6
February	36	2,301	2	6
March	42	2,837	6	5
April	44	4,194	7	2
May	44	1,875	13	8
June	33	5,055	8	1
July	34	2,583	4	2
August	43	2,189	11	2
September	52	3,891	8	3
October	65	5,220	10	4
November	43	3,133	8	0
December	48	3,482	7	2
Total 1940	535	39,250	92	41
Total 1939	629	35,984	142	27
Difference	94	3,266	50	14

Annual Review of Rocky Mountain Area

(Continued from Page 138)

set at 2,565 ft. The sands which were tested through perforations were at 2,031-2,115, 2,274-2,318 and 2,482-2,512 ft. In September the company completed its 2-A Kuykendall, SW NW SW 23-12n-100w, 900 ft. due south of 5-A Wilson, at 2,584 ft. for 40 bbl. first 24 hours without any change in the second period. It had a water sand at 2,062-2,180 ft., an oil sand at 2,310-54 ft., a gas sand at 2,427-40 ft., and a water sand at 2,490-2,564 ft.

Fort Collins

Late in 1939 Continental Oil Co. 1 Meyer, SW SE SW 19-8n-68w, an old producer in the Muddy sand in the Fort Collins field, was deepened from 4,496 ft. and made a discovery in the Dakota sand at 4,658-83 ft., producing 300 bbl. of oil and 50 bbl. of water in 24 hours. In June 1940 a south offset, 1 Whitaker, NE NW NW 30-8n-68w, was deepened to the Dakota and made 19 bbl. in 24 hours on the pump. It then deepened 2 Larson, one-third of a mile north of the discovery, and had 50 bbl. of oil and 142 bbl. of water in 24 hours from the Dakota at 4,682-85 ft. Results in the three wells show that the productive area in the Dakota sand will be very small.

Completions by Months

January	2	1	250	1	0
February	0	0	0	0	0
March	2	0	0	2	0
April	0	0	0	0	0
May	1	0	0	1	0
June	1	1	281	0	0
July	3	1	19	2	0
August	2	2	90	0	0
September	1	1	14	0	0
October	2	2	212	0	0
November	4	2	438	1	1
December	1	0	0	1	0
Total	19	10	1,304	8	1

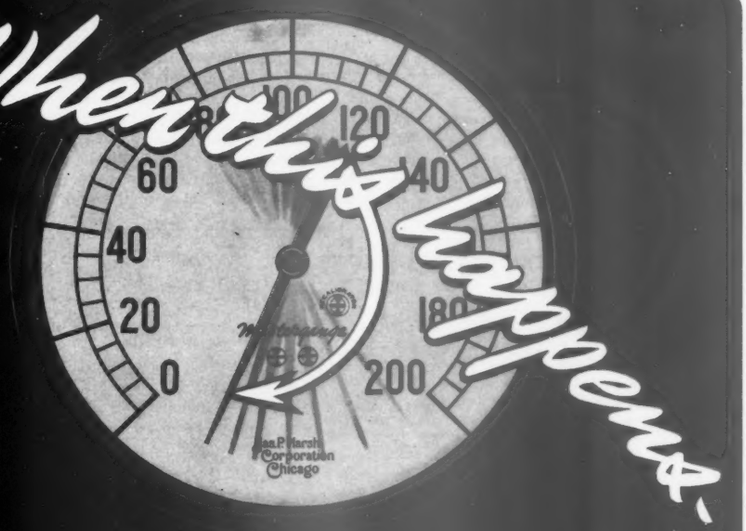
NORTHWEST NEW MEXICO

Completions by Months

January	2	0	0	1	1
February	2	1	59	1	0
March	3	1	25	1	1
April	1	0	0	0	1
May	1	0	0	1	0
June	3	1	150	2	0
July	5	1	150	4	0
August	5	2	226	3	0
September	2	2	72	0	0
October	4	3	97	1	0
November	0	0	0	0	0
December	1	0	0	1	0
Total	29	11	779	15	3

(For 1940 production record of Northwest New Mexico see Page 135)

MARSH



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GAUGES

BAY CITY TEST MOST IMPORTANT IN YEAR OF PRODUCTION DECLINE

LAST year marked the opening of several small pools and numerous extensions to old fields in Michigan, but for the second consecutive year no major fields were discovered. As a consequence the state's annual production declined, with the greatest drop in output being shown by Traverse lime fields in the southwestern district. A drop in drilling activity of about 290 operations was shown for the year, most of the slackened activity taking place in the shallow west side area. Wildcatting operations, however, totaled practically the same as in 1939.

Most important test drilled in Michigan during 1940 was the Gulf Oil Corp. 1 Bateson at Bay City. This deep wildcat was carried to a total depth of 7,776 ft. where at the close of the year it was making about 50 bbl. daily of high-gravity oil under a controlled production of 5,000,000 cu. ft. of gas. Bottomed in either the Salina or upper Niagaran, the well blew out and completion was delayed until a new rig could replace the one destroyed. Should the well make a commercial producer, Michigan operators forecast the drilling of other deep tests in the central basin during 1941. Prior to the record Gulf test, 4,000 ft. represented the greatest depth of established oil or gas production in Michigan.

Annual Production Drops

Michigan's production during 1940 totaled 19,747,968 bbl., as compared with 23,566,406 bbl. in 1939, so that the downward trend started in 1938 was continued.

For the second time the Freeman-Redding field led the state in total production with 4,496,313 bbl., but during the year its daily output declined more than one-third and new production in other fields was not sufficient to offset decline. It was, however, the only Michigan field still under proration at the end of the year. Development of the Adams pool resulted in its monthly production growing from 3,441 bbl. in January to 68,696 bbl. in December. Aside from this gain and gains due to development of 1941 discoveries, all fields in the northeastern district (largely Monroe production) showed substantial declines in output during the year.

In the southeastern district where most of the fields produce from the Traverse, production declined about 50 per cent during the year due to lack of important discoveries. Allegan County fields showed a relatively small decline, but the Walker area dropped from a monthly total of 572,105 bbl. in January to 197,718 bbl. in December. Van Buren County's output fell off more than 50 per cent to 81,096 bbl. in December.

In the Mount Pleasant district production was more sustained, the output of 278,137 bbl. in December comparing with one of 298,654 bbl. in January. The district's most prominent area, Porter-Yost, produced 1,771,602 bbl. during the year with a decline in monthly production of about 5,000 bbl. between January and December.

Wildcatting Activity

A total of 375 wildcat tests were drilled during the year, practically the same as in 1939. Of the total drilled, about 250 were located in the shallow west side district with the remainder distributed throughout of the rest of the state. Result of this exploratory drilling was the completion of 19 oil wells and 6 gas

DISCOVERIES IN MICHIGAN DURING 1940

Field and county—	Company and farm name—	Location	Producing formation	Date of discovery	Depth (ft.)	Initial (bbl.)
....., Clare	Sun Oil Co. 1 Switzer	C N½ NW NE 26-19n-3w	Stray	2-27-40	1,277	Gas
Richland, Montcalm	E. C. Dailey 1 Church	SW SW NW 17-12n-5w	Stray	2-28-40	1,215	Gas
Holland, Ottawa	Crown Dev. Co. 1 Reimold	SW NW NE 34-5n-15w	Traverse	3- 5-40	1,522	340
South Overisel, Allegan	Lang-Lewis, Inc. 1 Nevenzel	C E½ NW SW 3-3n-14w	Traverse	3-25-40	1,477	200
Heath, Allegan	Frank Vahue 1 Klein	W½ SW NW 10-3n-14w	Traverse	4-15-40	1,532	127
Dalton, Muskegon	Strom-Shiffman 1 Lund	NW NE NE 15-11n-16w	Traverse	5- 1-40	1,889	15
North Overisel, Allegan	H. C. Nelson 1 Peters	SE SE NE 8-4n-14w	Traverse	6- 5-40	1,478	345
Grout, Gladwin	Sun Oil Co. 1 Cameron	C E½ NE SE 10-18n-2w	Dundee	6- 6-40	3,840	30
Winterfield-Marion, Clare-Osceola	Taggart Bros. Co. 30 Woodin	C SW 19-20n-6w	Stray	6-27-40	1,790	Gas
Riverside, Missaukee	Taggart Bros. Co. 29 Quist	C NW 22-21n-7w	Stray	7- 1-40	1,516	Gas
North Adams, Arenac	Don Rayburn 1 Yenior	NE SW NE 22-19n-3e	Dundee	7-15-40	2,880	475
Geneva, Van Buren	Smith Pet. Co. 1 Fellows	W½ SW SW 22-1s-16w	Traverse	7-17-40	1,047	40
Hamilton, Clare	Sun Oil Co. 1 McKenna	SE SW SE 15-19n-3w	Dundee	8- 2-40	3,755	*1,290
Casco, Allegan	A. R. Urion 1 Antonson	SE SE SE 34-1n-16w	Traverse	8-25-40	1,115	25
Niles, Berrien	Lakeland Oil Co. 1 Plym	SW SW NE 1-7s-17w	Traverse	9- 1-40	605	10
Georgetown, Ottawa	Fisher-McCall 1 Van Single	NW NE NW 2-6n-13w	Traverse	9-14-40	1,790	65
Bi-State, Cass	Tamblyn Dev. Co. 1 Woolverton	SE NW NE 22-8s-15w	Traverse	9-14-40	685	15
Bloomfield, Huron	Cryden Pet. Corp. 1 McDonald	SW NE NE 20-17n-14e	Traverse	9-25-40	1,429	*120
North Star, Gratiot	V. R. Wilson 1 Cook	SE NE 4-10n-2w	Stray	10- 4-40	881	Gas
Mid-Pool, Van Buren	Clapsaddle-Harris 1 Peavey	SW NE NE 15-1s-14w	Traverse	10- 7-40	1,265	600
Winterfield, Clare	Sun Oil Co. 1-A State	C N½ NE SE 35-20n-6w	Dundee	10-14-40	3,795	45
....., Montcalm	Belvidere Oil Co. 1 Bradley	SE NW NE 20-12n-7w	Stray	10-17-40	1,307	Gas
Marion, Clare	Rowmor-Hughes 1 Wyman	C W½ SW SE 29-20n-6w	Dundee	11-17-40	3,775	245
Lincoln, Osceola	Taggart Bros. 55 Lomp	SW SE SE 30-18n-10w	Stray	11-17-40	1,246	Gas
Reed City, Osceola	Weber Oil Co. 1 Gabel	NE NE SW 31-18n-10w	Monroe	11-18-40	3,635	35
Tallmadge 5, Ottawa	Daily Crude Oil Co. 1 Powell	NE NW NW 5-7n-13w	Berea	11-21-40	1,186	20
Overisel 11, Allegan	W. L. McClanahan 1 Campaigner	SW SE SE 11-4n-14w	Traverse	12-28-40	1,575	140

*Abandoned.

MICHIGAN CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

NORTHEASTERN DISTRICT—	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
Freeman-Redding	4,496,313	12,285	459,327	402,723	437,410	385,830	367,877	379,170	413,478	366,637	347,760	336,567	301,500	298,034
Beaverton	95,576	261	3,596	4,698	3,999	4,410	3,720	3,960	3,968	4,867	19,560	16,244	14,190	12,364
Edenville	108,187	295	12,338	11,397	10,943	10,680	8,339	9,300	8,556	8,525	8,610	7,626	6,180	5,693
Bentley	121,456	331	11,873	11,542	12,059	10,650	8,525	9,240	10,509	10,664	10,650	9,548	8,460	7,736
Buckeye-Wicklund	995,514	2,731	114,607	107,416	98,053	90,480	94,054	76,870	78,833	76,818	71,310	69,316	69,780	60,977
Ogemaw	486,757	1,330	45,694	45,762	42,594	42,960	44,981	41,550	38,099	43,741	38,400	36,983	34,380	31,613
Adams	322,073	880	3,441	3,828	4,061	3,180	3,596	5,580	18,135	53,611	38,970	59,365	59,610	68,696
Clayton	436,438	1,192	45,167	32,103	36,642	33,360	41,850	36,570	41,044	37,665	32,670	35,557	31,950	31,860
Miscellaneous	30,039	82	930	261	62	.....	279	570	496	8,742	1,950	2,387	5,430	8,932
Total	7,096,353	19,389	696,973	619,730	645,823	581,550	573,221	562,810	613,118	611,270	569,880	573,593	522,480	525,905
MOUNT PLEASANT DISTRICT—														
Porter-Yost	1,771,602	4,840	146,816	146,653	147,374	150,540	151,838	146,430	150,474	148,955	146,220	151,032	143,850	141,420
Mount Pleasant	454,671	1,242	39,773	37,555	40,207	39,390	38,037	36,480	35,867	39,370	37,740	38,967	35,850	35,435
Geneva	3,031	8	279	145	372	420	403	420	496	496	.....	.....	.....	.....
Sherman	462,844	1,265	38,378	38,048	40,827	43,470	44,671	38,130	43,586	40,734	33,900	36,301	32,580	32,219
Wise	849,807	2,322	50,406	49,793	66,805	84,480	101,370	95,430	92,070	77,190	65,370	64,170	51,480	51,243
Vernon-Leaton	254,006	694	23,002	20,793	24,335	23,880	21,607	18,810	23,219	22,878	19,290	20,522	17,850	17,820
Total	3,795,961	10,371	298,654	292,987	319,920	342,180	357,926	335,700	345,712	329,623	302,520	310,992	281,610	278,137
SOUTHWESTERN DISTRICT—														
Allegan County	2,709,939	7,404	258,633	217,181	226,176	253,320	237,057	230,160	222,952	199,702	197,370	243,288	200,280	223,820
Walker	4,331,041	11,833	572,105	538,240	530,565	465,780	408,983	349,260	322,617	284,239	249,690	229,834	182,010	197,718
Van Buren County	1,512,388	4,132	195,982	176,826	172,848	160,040	152,148	121,470	114,111	98,983	87,890	87,544	63,450	81,096
Miscellaneous	39,577	108	2,480	2,847	5,859	3,510	3,441	3,960	2,201	2,697	3,270	2,976	3,210	3,126
Total	8,592,945	23,477	1,029,200	935,094	935,448	882,650	801,629	704,850	661,881	585,621	538,220	563,642	448,950	505,760
OTHER FIELDS—														
Dundee	104,332	285	4,371	13,108	9,424	10,590	10,881	5,045	7,223	9,362	9,390	8,804	8,310	7,824
Montcalm	108,265	296	9,021	10,382	10,354	10,110	9,579	8,550	9,300	9,858	8,400	7,502	7,800	7,409
Miscellaneous	50,112	137	5,449	4,147	4,061	4,020	4,154	3,420	4,371	4,340	3,990	3,689	4,350	4,121
Total Michigan	19,747,968	53,956	2,043,668	1,875,448	1,925,030	1,831,100	1,757,390	1,620,375	1,641,605	1,550,074	1,432,400	1,468,222	1,273,500	1,329,156
Daily average	.....	.....	65,924	64,670	62,097	61,033	56,690	54,013	51,955	50,002	47,747	47,362	42,450	42,876
Total 1939	23,566,406	64,565	1,741,673	1,665,860	1,813,624	1,911,120	2,078,209	2,026,470	2,135,838	2,119,315	1,922,400	2,005,452	2,041,080	2,105,365
Total 1938	36,008,527	98,653	3,226,339	2,887,254	3,145,000	2,954,202	3,009,427	2,738,019	2,901,880	2,956,461	2,867,801	3,031,886	3,250,438	3,039,820
Total 1937	38,438,072	105,310	2,744,129	2,735,529	3,116,093	3,156,154	3,412,581	3,430,106	3,436,277	3,399,083	3,389,442	3,241,495	3,109,259	3,267,924
Total 1936	26,647,459	72,807	1,865,049	1,838,608	2,097,447	2,055,198	1,303,441	2,183,776	2,235,797	2,329,632	2,251,558	1,510,447	2,469,218	2,506,288

wells, with the remainder failing to establish commercial production. Five of the new oil discoveries were in the Dundee and of the remainder all were in the Traverse except one.

The two most important new pool discoveries of the year, aside from the Gulf opener at Bay City, were Don Rayburn 1 Yenior in Adams Township, Arenac County, and the H. C. Nelson 1 Peters in Overisel Township, Allegan County. In each instance the tests opened new pools off oil fields where original development had been undertaken 2 or 3 years previously. Other oil and gas discoveries of the year are listed in the accompanying discovery table.

As is shown in the completion table, over two-thirds of the drilling took place in Allegan, Clare, Kent, Ottawa and Van Buren counties. This activity consisted of drilling up the Freeman-Redding pool of Clare County, the Walker-Wyoming-Tallmadge pool in Kent and Ottawa, and the New Salem and other pools in Allegan and Van Buren counties. Of note is the fact that of 772 completions in the above named counties, 332 were dry holes. In Van Buren County 74 of 103 completions were dry holes.

Natural-gas reserves were materially increased during 1940 with the discovery and semidevelopment of six new pools. Three of these, Riverside, Winterfield-Marion and Wise-Isabella will be provided with an outlet early this year upon completion of a 60-mile carrier into the Saginaw Valley consuming area. Total natural-gas production increased from 10,000,000,000 cu. ft. in 1939 to 14,500,000,000 cu. ft. in 1940.

Under legislation enacted by the 1939 legislature, Michigan in 1940 received its first oil-control law and at the same time became a member of the Interstate Oil Compact. While operation of the act was not welcomed 100 per cent, in the main it has had the support of the majority of the industry.

Leaders in the industry anticipate that legislation will be sponsored by certain groups in the current session to either kill or amend the bill. A new organization, the Oil Institute of Michigan, organized late in the year, announced that it was opposed to limiting of oil production by proration until the supply equaled the overall refined-products sales demand or about 150,000 bbl. of crude per day. Proponents of state oil control, on the other hand, are convinced that the 1939 law saved thousands of dollars for producers, stabilized the market, and prolonged the lives of many new fields.

Field Developments in 1940

County or field—	No. of wells Jan. 1, 1940	No. of wells Dec. 31, 1940	County or field—	No. of wells Jan. 1, 1940	No. of wells Dec. 31, 1940
Freeman-Redding	125	145	Geneva	2	2
Beaverton	20	22	Sherman	56	61
Edenville	31	26	Wise	19	56
Bentley	36	35	Vernon-Leaton	87	76
Buckeye	371	289	Allegan	313	516
Ogemaw	235	229	Van Buren	227	287
Adams	13	25	Walker	286	457
Clayton	51	51	Dundee	8	14
Porter-Yost	349	340	Montcalm	27	34
Mt. Pleasant	197	177	Misc.	154	154
				2,607	2,996

Miscellaneous Fields

	Production 1940	Daily average	No. of wells 1-1-40	No. of wells 12-31-40
Northeastern district:				
Grant	1,391	4	4	3
Secord	1,350	4	2	2
Grout	3,982	22	..	2
Hamilton	9,957	67	..	2
Winterfield	10,969	90	2	2
Reed City	2,580	42	..	1
Holland-Zeeland	12,971	35	1	3
Muskegon	27,326	75	65	57
Tuscola	558	18	2	1
Saginaw	40,022	110	55	56
Birch Run	9,542	26	25	25

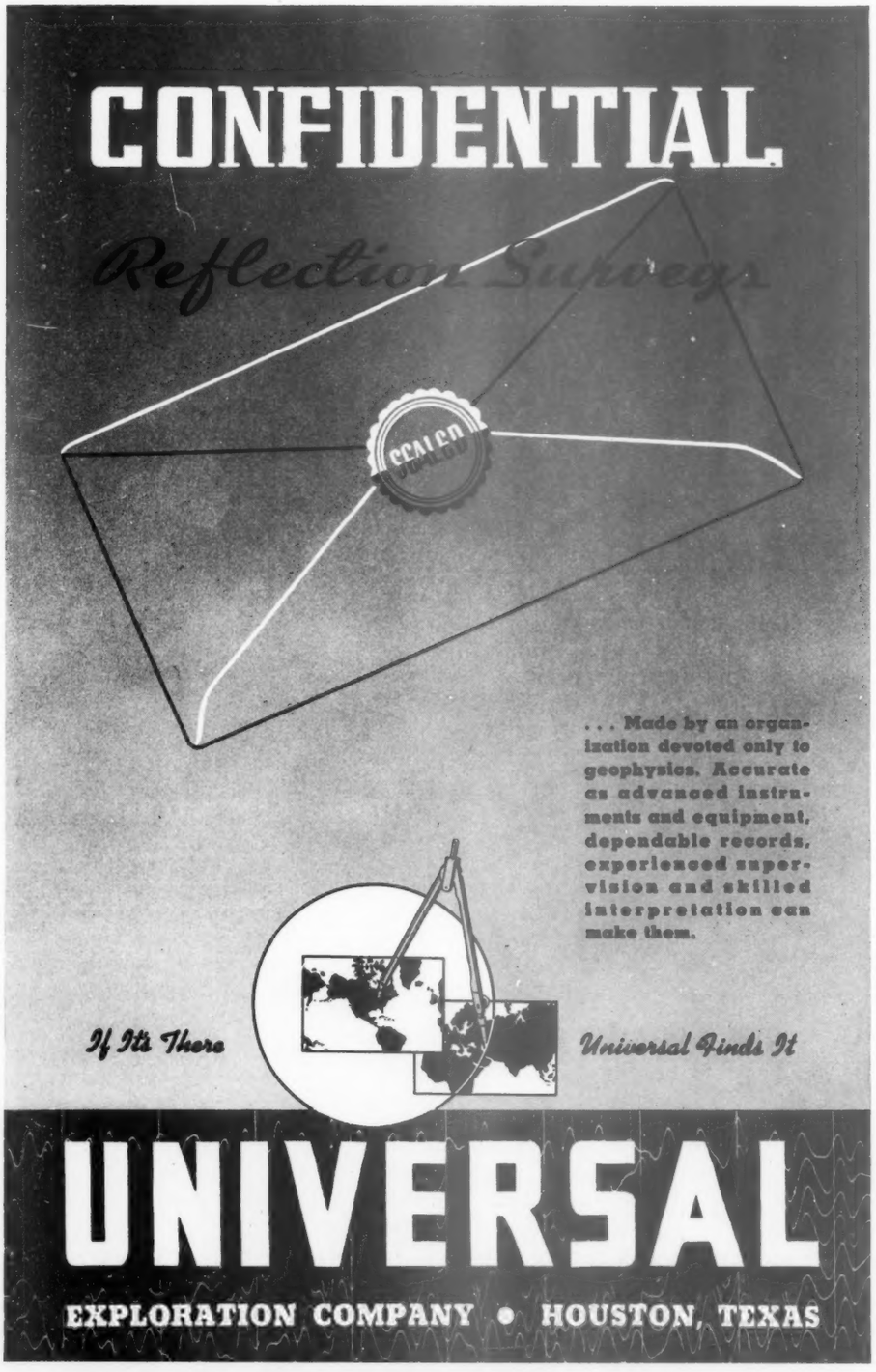
MICHIGAN

Summary of Wells Completed for 1940

County—	Comp.	Prod.	Dry	Gas
Allegan	275	23,695	136	0
Arenac	31	12,673	12	6
Barry	13	25	10	0
Bay	3	130	2	*0
Berrien	8	0	8	0
Calhoun	3	0	3	0
Cass	9	3	8	0
Clare	66	17,761	22	15
Chippewa	1	0	1	0
Eaton	1	0	1	0
Genesee	4	0	4	0
Gladwin	16	1,262	11	0
Gratiot	5	0	4	1
Huron	2	0	2	0
Ingham	1	0	1	0
Ionia	2	0	2	0
Isabella	66	13,164	16	1
Jackson	5	0	5	0
Kalamazoo	8	0	8	0
Kent	150	17,212	48	1
Lake	1	0	1	0
Lenawee	3	0	3	0
Manistee	1	0	1	0
Mason	1	0	1	0
Mecosta	2	0	2	0
Midland	18	1,532	4	0
Missaukee	7	0	6	1
Monroe	33	1,614	18	0
Montcalm	33	0	16	17
Muskegon	3	0	3	0
Newaygo	3	0	3	0
Oakland	4	0	4	0
Oceana	2	0	2	0
Ogemaw	9	196	2	0
Osceola	11	0	5	6
Otsego	1	0	1	0
Ottawa	178	21,953	52	2
Roscommon	3	0	3	0
St. Clair	4	0	4	0
St. Joseph	1	0	1	0
Saginaw	3	0	3	0
Shiawassee	4	0	4	0
Tuscola	5	325	0	0
Van Buren	103	3,566	74	0
Washtenaw	1	0	1	0
Total	1,104	115,241	518	50

Completions by Months

Month—	Comp.	Prod.	Dry	Gas
January	102	22,172	39	3
February	97	16,930	25	4
March	100	7,814	49	2
April	96	9,726	33	0
May	103	9,607	43	0
June	103	9,017	43	5
July	88	4,702	55	6
August	91	5,757	55	3
September	83	10,934	40	6
October	101	11,395	52	10
November	65	3,999	36	11
December	75	3,188	48	0
Total 1940	1,104	115,241	518	50
Total 1939	1,392	434,492	527	52
Difference	286	319,251	9	2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Forest City Production Limited To Southeast Nebraska

NEBRASKA'S first commercial oil, discovered little more than a year ago at Falls City in the extreme southeast corner of the state, was developed into an important pool during 1940 and in the middle of last November, holdings of the discovering Pawnee Royalty Co. were purchased by Ohio Oil Co. for further development.

It was not until spring that operators determined they had found a pool of some size and the drilling campaign got under way. Prior to that time, most of the wildcatting in the region was done in the Missouri section of the Forrest City basin in which Falls City is located. There had also been some testing in the Kansas sector, and a few holes were drilled in Iowa.

Results, however, were discouraging up to the time the Pawnee 1 Boice came in November 1, 1939, and many companies were reluctant to get into the play. The discovery well found oil in Hunton lime at a total depth of 2,292 ft., but it failed on the first 60-day pumping test when water broke in and the oil yield dwindled.

After the hole was cleaned out and reconditioned, production averaged 100 bbl. of oil and 300 bbl. of water daily for some time. The operators next tested southwest of the discovery, and also tested the Viola and the Arbuckle in the discovery well, but had no success. Next, Pawnee drilled 1 Bucholz, about ½ mile south and ¼ mile east of the 1 Boice, found formations checking 59 ft. higher than the discovery well and completed the well in the Hunton lime for 330 bbl. a day.

By that time other small operators had started drilling, particularly after Harry Harper, contractor who had drilled the Pawnee wells, found production ¾ mile southeast of the Bucholz. In November, when Ohio Oil Co. announced that it had purchased the Pawnee Royalty Co.'s holdings in the Forest City basin, nine oil wells were involved in the deal.

Thirty Wells Are Completed

Altogether, 30 wells were producing in the area by the year's end. All production to date is from the Hunton lime, although four tests were drilled to the Viola or lower and one Pawnee well was waiting for a Viola test with the pipe set. The new owner, Ohio Oil Co., was apparently waiting to drill this in in fear of starting a drilling boom. Several other tests in the basin area of Missouri, Kansas, Iowa, and Nebraska were under way, however.

Ohio has been selling some crude to the small refinery operated at Omaha by H. A. Searle & Co. and some is being loaded out in tank cars. R. L. Campbell of St. Joseph, who has four wells, has been selling to the Bell Pipe Line Co., which has a gathering system at the pool.

Mid-States Refining Co., headed by R. D. Swan of Joliet, Ill., also has built a refinery at Falls City and started operations late in December. In its initial run it was skimming about 1,000 bbl. a day. Nebraska Producing & Refining Co. has a 2,000-bbl. skimming plant at Salem, around 7 miles west of Falls City.

Falls City's pool by now is reasonably well defined. Wells along the west side have made too much water to be profitable. Water also has shown up to the southwest and the northeast. Various inside locations remain and it is one of these that the Ohio now is drilling.

Nemaha County, Nebraska, north of Richardson County, experienced an important drilling campaign during the year, but no oil was found. By fall the play was spreading to Atchison County, Missouri, to the east, and wildcats were drilling in De Kalb County and Holt County, Missouri, in northeastern Kansas and in Fremont County, Iowa.

A gas pool was opened in Caldwell County, Missouri, but little development has followed.

NEBRASKA

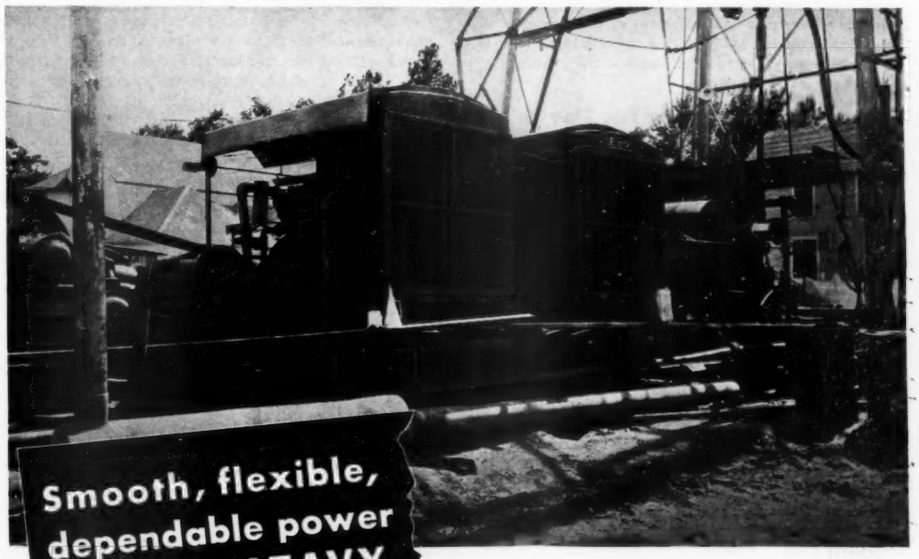
Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	0	0	0	0	0
February	0	0	0	0	0
March	1	0	0	1	0
April	0	0	0	0	0
May	0	0	0	0	0
June	4	2	1,474	2	0
July	7	3	1,112	4	0
August	10	4	1,198	6	0
September	11	9	2,737	2	0
October	17	10	4,725	7	0
November	10	3	794	7	0
December	4	1	618	3	0
Total 1940	64	32	12,658	32	0
Total 1939	2	1	130	1	0
Difference	62	31	12,528	31	0

MISSOURI

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	5	0	0	4	1
February	5	0	0	5	0
March	1	0	0	1	0
April	4	0	0	3	1
May	0	0	0	0	0
June	2	0	0	2	0
July	6	0	0	5	1
August	3	0	0	2	1
September	4	0	0	1	3
October	4	0	0	3	1
November	3	0	0	2	1
December	1	0	0	0	1
Total 1940	38	0	0	28	10
Total 1939	46	0	0	37	9
Difference	8	0	0	9	1



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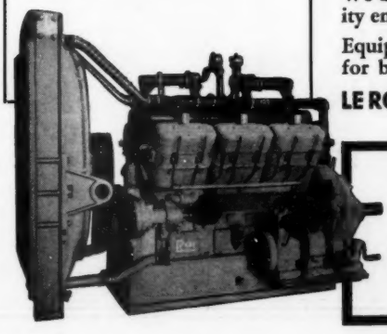

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JACKSON COUNTY FIELDS, OFFSHORE DRILLING, HIGHLIGHT YEAR

By NEIL WILLIAMS

WHILE exploration along the Texas Gulf Coast district during 1940 added 17 new pools, only 4 could be classified at the end of the year as important reserves. Drilling fell short of the previous year with a total of 1,232 wells drilled. Of this number 224 were dry and 31 gas wells. The total completed wells represents a decrease of 133 wells from the preceding year, and the figure would have been considerable lower had it not been for the West Ranch field in Jackson County where new sand discoveries and important extensions provided an incentive for a widespread drilling campaign which at the close of the year was still unabated.

Jackson County Frio Play

The search for additional Frio sand pools in Jackson County which got underway on a rather extensive scale following the development of the West Ranch field, resulted in the discovery of the Lolita, Northeast Texana and the West Ganado fields, and another structure was apparently proven productive in the La Ward area where a wildcat was showing for a pool opener. Lolita was opened by the completion of Wellington Oil Co. 1 L. Ranch, completed in the Frio sand at 5,933-37 ft. The area was extended 1½ miles west by Barnsdall, 1 Lazarus which checked structurally higher than the discovery well. Protection acreage is held by numerous independents and major companies, and the structure is receiving an extensive drilling campaign. Production was extended to the townsite of Lolita while additional sands were proven productive at 6,395-98 ft., and at 5,250-78 ft. Although the structure is still in the early stages of development it appears to be similar to that of the West Ranch field where numerous sands flanking the apex of the structure have proven productive.

The wildcatting play in Jackson County is interesting in view of the fact that previous development had been disappointing and the county received little attention until the opening of the West Ranch field which now represents one of the district's most important fields. All previous fields were limited to small areas due to erratic sand conditions. Leasing and geophysical activity has extended throughout the county and several blocks assembled during the year are scheduled to be drilled during 1941.

Pure Oil Co. which opened the West Ganado field is engaged in drilling a third well on that structure after abandoning an offset to the discovery and the potentiality of this structure cannot yet be determined. No additional development has been started in the Northeast Texana field located about 2 miles northeast of the Texana field in the P. Scott Survey which was opened as a gas-distillate field at 6,170-75 ft. by A. E. Masterson et al on the J. R. Robertson lease.

Additional light was thrown upon the Wilcox trend with the opening of the Sheridan field, Colorado Coun-

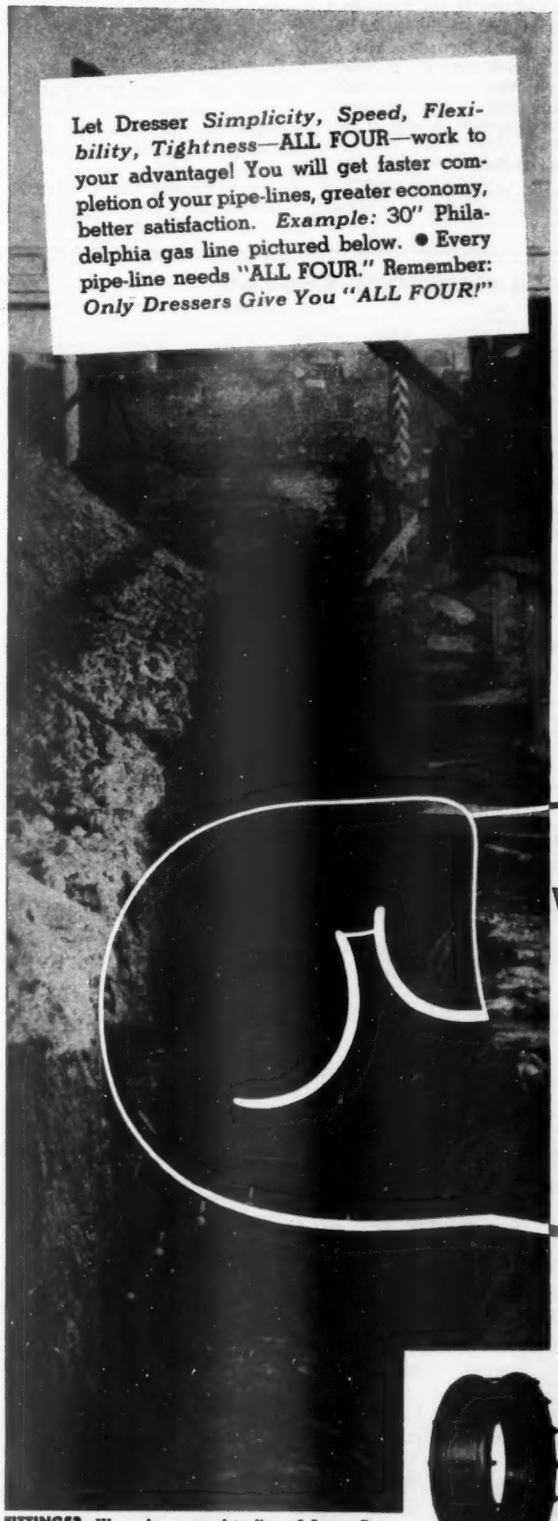
DISCOVERIES IN TEXAS GULF COAST DURING 1940

Pool, county, company, and farm name—	Survey	Date of Comp.	Producing formation	Producing depth	Initial production	No. prod. wells Jan. 1, '41
Bailey's Prairie, Brazoria, Glenn H. McCarthy, 1 W. B. Munson	S. Carter	11-8	Frio	11,615-49	Flwd. gas and dist., sanded up T.A.	1
Blessing, Matagorda, Texas Co., 1 A. H. Pierce	H.&G.N. 1	6-27	Frio	8,265-8,300	36 bbl. dist. 21 hr., ⅛-in. ck.	2
Dyersdale, Harris, H. C. Cockburn, 1 George Burkitt	G. W. Burkitt	9-12	Frio	4,068-83	455 bbl., ¼-in. ck.	9
East Bernard, Wharton, Cockburn Oil Corp., 1 J. G. Leveridge	J. Scott	5-7	Cook Mountain	8,074-89	40 bbl., ⅛-in. ck.	1
Fig Ridge, Chambers, Sun Oil Co., 1 Carrie Smith	T.&N.O. 82	7-3	Frio	8,849-53	84 bbl. fluid, 2% S.W., ⅛-in. ck.	1
Lissie, Wharton, Gulfboard Oil Co., 1 Winnie Pool	G.H.&H., Sec. 25	8-9	Frio	6,728-34	25 bbl. dist., 5/32-in. ck.	1
Lolita, Jackson, Wellington Oil Co., 1 L. Ranch Co.	I.&G.N. 11	5-25	Frio	5,933-37	335 bbl., ¼-in. ck.	57
Mackey, Wharton, J. F. Hutchins, 2 Borden	E. M. Cox	1-28	Heterostegina	4,758-71	4 bbl., ¼-in. ck.	1
Ogburn, Harris, Joyce Richardson, 1 E. Marks	J. C. Ogburn	7-20	Yegua	6,918-26	108 bbl. dist., 11/64-in. ck.	5
Red Fish Reef, Chambers, Humble O. & R. Co., 1-A-247 State	No. 247	8-23	Frio	8,814-16	24 bbl. dist., ⅛-in. ck.	2
Rowan (Liverpool), Brazoria, Rowan & Nichols, 1 Hubbard	W. H. Harris	6-26	Frio	8,538-54	187 bbl. dist., ⅛ in. ck.	7
Sheridan, Colorado, Shell Oil Co., Inc., 1 Plow Realty	O. K. Winn	5-28	Wilcox	8,135-43	237 bbl. dist., ⅛-in. ck.	3
West Ganado, Jackson, Pure Oil Co., 1 Spacek	Wm. Menefee	10-24	Frio	5,204-20	240 bbl. dist., 12/64-in. ck.	1
Alta Loma, Galveston, Stanolind O. & G. Co., 1 J. A. Hulen	A. Brigham	June	Frio	9,156-66	598 bbl. oil plus 65% S.W. (blew out)	2
Fishers Feef, Chambers, Humble O. & R. Co., 1-2-C-46 State	No. 46	11-15	Frio	8,961-63	197 bbl., ⅛-in. ck.	1
Shepherd, San Jacinto, Harrison & Abercrombie, 1 Sun Oil Co.	Wm. Hays	9-20	Wilcox	8,215-77	70 bbl., various chokes	1
Northeast Texana, Jackson, R. D. Swiger et al, 1 J. R. Robertson	P. Scott	7-5	Frio	6,170-75	18 bbl. dist., 3/32-in. ck.	1

TEXAS GULF COAST CRUDE-OIL PRODUCTION—JANUARY-DECEMBER, 1940, INCLUSIVE

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
AUSTIN COUNTY—														
Raccoon Bend	1,229,446	3,359	89,683	129,448	138,705	131,190	122,171	99,960	88,577	82,892	79,924	83,799	81,448	101,649
BRAZORIA COUNTY—														
Anchor	246,808	674	7,874	10,769	17,278	18,262	25,885	26,910	24,171	21,301	22,650	23,258	23,278	25,172
Damon Mound	102,974	281	9,114	9,583	8,759	8,765	9,920	9,240	7,956	7,555	7,563	6,808	8,039	9,672
Danbury	105,872	289	9,517	7,930	9,175	8,463	8,401	7,830	8,540	7,540	7,207	10,418	9,598	11,253
Hastings	5,500,282	15,028	531,030	495,297	535,944	504,890	485,491	344,040	318,307	294,870	357,129	399,389	615,390	618,505
Lochridge	804,378	2,198	80,910	75,345	81,698	79,431	72,726	68,940	53,329	49,920	63,431	65,481	47,912	65,255
Manvel	2,616,509	7,149	234,484	186,821	295,400	268,140	256,060	198,600	194,493	223,309	217,071	224,031	157,489	160,611
Old Ocean	4,150,434	11,340	360,561	347,521	367,990	372,494	332,661	308,610	299,943	298,128	408,668	414,035	324,088	315,735
Rowan	25,609	139	.....	.....	.....	.....	.....	.....	2,062	2,091	4,200	5,374	4,318	7,564
West Columbia	2,319,574	6,338	224,781	205,146	218,629	209,786	200,658	191,580	183,232	190,106	179,641	192,224	176,820	146,971
Miscellaneous	58,278	159	1,829	1,083	175	2,082	4,681	6,300	9,270	6,963	7,611	8,606	5,400	4,278
Total	15,930,718	43,527	1,460,100	1,339,495	1,535,048	1,472,313	1,396,483	1,162,050	1,101,303	1,101,783	1,275,171	1,349,624	1,372,332	1,365,016
CHAMBERS COUNTY—														
Anahuac	2,679,491	7,321	190,712	182,268	292,182	279,979	248,093	205,620	179,244	167,155	163,030	181,957	281,669	307,582
Barbers Hill	3,286,608	8,980	288,703	262,295	277,718	265,388	273,544	259,530	280,155	272,282	257,290	264,073	296,710	288,920
Cedar Point	413,715	1,130	46,531	37,303	41,038	41,403	37,107	30,270	27,611	32,209	34,574	35,603	25,886	24,180
Cotton Lake	103,271	282	9,920	8,925	9,461	8,898	10,137	9,600	7,366	7,572	7,457	8,574	7,859	7,502
Cotton Lake (South)	603,926	1,650	44,826	45,103	46,521	46,756	46,810	45,000	48,293	44,573	60,809	63,422	46,620	65,193
Lost Lake	31,520	86	2,728	2,638	2,477	2,468	3,317	3,150	2,368	2,604	2,228	2,483	2,548	2,511
Seabreeze	107,552	294	9,393	9,785	10,719	10,336	5,363	4,230	9,065	9,021	10,782	10,934	8,314	9,610
Turtle Bay	263,589	720	27,497	24,929	27,063	26,100	26,133	25,470	17,028	15,854	15,864	16,527	14,588	26,536
Willow Slough	95,508	261	9,920	9,812	11,563	10,850	7,233	5,850	8,055	6,805	8,183	5,516	4,808	6,913
Miscellaneous	14,887	81	.....	.....	.....	.....	.....	.....	1,992	1,650	1,693	1,747	2,400	5,405
Total	7,600,067	20,765	630,230	583,058	718,742	692,178	657,737	588,720	581,177	559,725	561,910	590,836	691,402	744,352
COLORADO COUNTY—														
Miscellaneous	29,622	81	186	205	70	.....	.....	150	3,330	4,010	5,223	5,947	5,820	4,681
FORT BEND COUNTY—														
Big Creek	135,324	370	11,098	10,664	12,213	10,914	10,633	10,140	9,311	10,623	10,335	13,168	13,050	13,175
Blue Ridge	274,024	749	20,708	22,361	23,927	22,367	23,095	22,320	23,468	22,241	20,460	24,979	21,810	26,288
Orchard	110,327	301	16,430	13,298	14,356	13,028	5,611	3,960	10,732	10,156	10,156	4,258	3,754	4,588
Sugarland	1,350,424	3,690	186,527	140,771	152,520	142,967	131,285	100,980	90,528	82,953	79,199	82,962	79,380	80,352
Thompson	4,338,727	11,854	455,297	354,468	433,875	428,909	418,778	403,470	315,628	301,463	290,289	328,752	305,610	302,188
Rosenberg	10,825	30	1,085	1,402	927	1,277	1,147	1,560	.....	401	357	899	840	930
Total	6,219,651	16,994	691,145	542,964	637,818	619,462	590,549	542,430	449,667	427,837	410,796	455,018	424,444	427,521
GALVESTON COUNTY—														
Capien	107,147	293	7,595	8,427	9,604	10,174	8,711	7,530	8,047	8,278	7,784	9,365	7,527	14,105
Dickinson-Gillock	2,986,977	8,161	445,346	310,036	331,952	310,849	304,141	250,950	200,971	184,346	178,521	174,108	174,330	121,427
High Island	956,154	2,612	78,182	73,453	78,299	76,487	80,352	74,070	85,784	86,933	84,599	84,866	67,592	84,537
Hitchcock	201,313	550	22,258	21,272	19,906	20,388	18,073	14,580	12,138	12,814	13,017	14,071	15,033	17,763
League City	725,051	1,981	84,909	65,845	73,308	66,816	68,913	52,800	45,315	41,355	55,728	59,405	59,228	51,429
Miscellaneous	31,749	87	248	307	438	1,375	1,550	1,560	1,325	2,697	3,526	4,273	6,390	8,060
Total	5,008,391	13,684	638,538	479,340	513,507	486,089	482,740	401,490	353,580	336,423	343,175	346,088	330,100	297,321
HARDIN COUNTY—														
Ariola	122,106	334	7,998	7,109	6,388	6,306	6,541	9,610	11,472	12,638	14,340	13,807	11,730	14,167
Batson	460,127	1,257	38,595	39,761	38,905	41,995	43,710	40,860	30,241	36,945	42,333	39,629	27,628	39,525
Saratoga	306,955	839	23,157	22,137	23,741	24,121	24,583	22,980	27,019	30,226	28,716	25,569	28,922	25,784
Silsbee	373,196	1,020	37,882	36,595	39,356	36,765	38,657	26,340	23,564	22,445	21,279	22,247	21,690	46,376
Sour Lake	414,858	1,133	30,349	38,182	37,149	38,452	41,912	38,700	31,947	30,878	29,614	31,524	33,570	32,581
Total	1,677,242	4,583	137,981	143,784	145,539	147,639	155,403	138,490	124,243	133,132	136,282	132,776	123,540	158,433

(Continued on Page 156)



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ty, and the Shepherd field in San Jacinto County. Both discoveries extended the line of such fields over 100 miles westward and opened the way for further development along the trend where interest had been at a low edd due to the failure of many wildcats which were drilled on highly regarded prospects. There is little doubt that this trend represents several million barrels in new reserve, but with development still limited to only a few key wells considerable development remains to be done before a true picture of the trend can be obtained.

The discovery at Sheridan was drilled by Shell Oil Co. Inc., on a geophysical block of several thousand acres, and while the structure is still in the early stages of development, the limits of the field have been extended considerably by the completion of two additional producers, and the company is now engaged in drilling a deep test as an exploratory well in search of deeper sand sections in the lower Wilcox formation.

San Jacinto County received its first production with a gas-distillate field that was drilled by Harrison & Abercrombie. Production was obtained by perforating casing in the Wilcox at 8,215-77 ft. The field is located on strike with the Sheridan field, the most westerly Wilcox sand pool in the Upper Texas Gulf Coast and the Segno field in Polk County. Since the opening of these fields together with the showing of other Wilcox tests drilled farther down dip in Southwest Texas, the trend is receiving a widespread leasing and geophysical program, and the area is expected to receive an extensive play during the year.

Galveston Bay

One of the most interesting and probably the most expensive drilling campaigns ever to take place in the district followed the opening of two Frio sand fields in Galveston Bay offshore from Chambers and Galveston counties. The discovery wells, both of which were drilled on state-owned leases by Humble Oil & Refining Co. are located on the Fisher's Reef prospect, about 7 miles southeast of the Cedar Point, and the Red Rish Reef prospect, 4½ miles southeast of Seabrook.

Practically all of Galveston Bay has been under lease to several major companies for the past four years and the area has been worked extensively with various types of geophysical instruments which is said to have uncovered several promising structures. With the approach of expiration dates on most of the leases, the companies have been forced to carry on an extensive wildcatting play, all of which has been done from drilling barges. The discovery well of Red Fish Reef was drilled in tract No. 247 and was com-

TEXAS GULF COAST CRUDE-OIL PRODUCTION—(Continued)

	Total	Dly. av.	January	February	March	April	May	June	July	August	September	October	November	December
HARRIS COUNTY—														
Bammell	251,873	688	21,845	25,163	28,036	22,264	7,843	6,930	20,465	25,156	24,907	23,120	24,024	22,120
Clear Lake	370,103	1,011	32,519	27,987	31,057	33,766	32,829	32,850	28,858	28,038	28,631	30,120	29,906	33,542
Fairbanks	2,434,661	6,652	207,421	238,663	259,476	245,346	224,657	183,060	164,499	151,788	188,353	193,504	188,732	189,162
Eureka	915,132	2,500	120,621	62,111	90,901	87,652	82,429	61,950	73,648	70,532	66,273	66,734	64,918	67,363
Friendswood	2,533,629	6,922	301,971	261,531	284,491	266,777	243,009	197,880	171,806	156,946	149,239	157,158	166,648	176,173
Goose Creek	603,034	1,648	49,011	46,728	50,419	45,800	51,212	51,360	50,851	49,959	48,239	49,272	56,189	53,994
Humble	1,044,999	2,855	103,819	81,931	94,477	82,858	98,549	93,600	75,982	76,094	72,166	75,843	98,850	90,830
Mykawa	382,174	1,044	26,226	23,953	29,953	30,795	38,130	36,720	25,799	25,155	26,278	29,247	45,598	44,320
Pierce Junction	670,668	1,832	63,953	73,803	55,523	56,406	63,643	59,370	49,636	46,001	42,165	48,570	55,550	56,048
Satsuma	119,070	325	7,595	12,931	13,108	11,726	12,431	9,660	8,884	7,234	10,363	10,201	7,590	7,347
South Houston	637,933	1,743	67,828	49,920	63,266	62,459	58,497	54,810	46,297	43,104	40,592	42,541	42,000	66,619
Tomball	2,511,155	6,861	189,534	178,799	191,056	313,970	289,044	233,880	204,329	187,671	179,814	188,219	164,220	190,619
Dyersdale	39,050	320	.....	.....	.....	.....	.....	.....	.....	.....	1,814	8,750	10,289	18,197
Miscellaneous	72,324	198	7,008	6,029	6,869	6,192	6,169	4,710	5,023	4,557	6,183	5,662	6,358	7,564
Total	12,585,805	34,387	1,199,351	1,089,549	1,198,632	1,266,011	1,208,442	1,026,780	926,077	872,235	885,017	928,941	960,872	1,023,898
HOUSTON COUNTY—														
Kittrell	116,623	319	10,751	10,985	11,257	12,533	10,168	8,490	6,820	6,317	9,249	8,260	11,222	10,571
JACKSON COUNTY—														
Cordele	733,097	2,003	82,429	73,434	78,199	73,434	62,713	52,020	46,310	53,486	66,862	68,915	49,410	25,885
Francitas	92,782	253	9,641	7,453	7,305	6,837	9,734	6,600	7,274	8,204	6,789	6,779	6,897	9,269
Ganado	74,217	203	2,387	3,854	4,981	5,597	6,231	4,950	5,103	6,052	7,926	10,359	9,027	7,750
Mauritz	190,440	520	6,076	4,869	8,589	12,831	15,345	19,110	18,919	28,294	22,199	23,462	15,928	14,818
West Ranch	1,778,555	4,859	71,889	67,854	88,713	99,833	152,055	141,720	156,795	179,129	225,520	247,408	187,710	159,929
Lolita	178,950	730	.....	.....	.....	.....	1,085	1,200	11,598	24,874	25,025	40,765	32,312	39,091
Miscellaneous	10,921	30	124	105	110	276	673	750	1,001	1,077	1,368	2,066	2,100	1,271
Total	3,058,962	8,358	172,546	157,569	187,897	198,808	247,836	229,350	247,000	301,116	355,689	399,754	303,384	258,013
JEFFERSON COUNTY—														
Amelia	887,192	2,424	85,559	96,088	102,390	95,210	78,709	69,630	58,261	53,474	51,073	53,421	51,028	92,349
Clam Lake	88,170	241	4,743	4,413	4,717	4,813	4,402	5,160	9,127	9,500	9,532	11,360	11,072	9,331
Fannett	177,300	484	8,959	8,694	11,415	10,258	11,377	13,140	14,406	16,669	18,551	21,581	19,620	22,630
Lovells Lake	872,104	2,383	45,260	78,515	76,656	75,223	69,874	61,830	57,058	55,725	74,156	81,027	80,158	116,622
Nome	316,637	865	25,172	25,174	26,910	25,160	22,754	23,700	26,429	24,347	23,258	24,027	23,268	46,438
Spindletop	573,369	1,567	52,266	54,776	43,704	54,181	55,769	54,870	36,253	33,917	44,807	60,674	39,930	42,222
West Beaumont	1,117,626	3,054	94,116	80,822	100,353	100,516	106,423	81,570	70,699	85,242	99,940	108,891	86,010	103,044
South China	107,600	294	6,076	6,798	7,813	9,171	8,773	7,500	7,564	8,698	10,386	11,373	10,590	12,858
Miscellaneous	51,625	141	6,572	5,858	5,751	6,791	1,550	1,200	5,122	4,627	4,269	2,700	2,938	4,247
Total	4,191,623	11,453	328,723	361,138	379,709	381,323	359,631	318,600	284,919	292,199	335,972	375,054	324,614	449,741
LIBERTY COUNTY—														
Cleveland	70,269	192	8,246	7,661	8,214	8,112	5,921	4,800	6,146	5,070	4,893	3,828	3,720	3,658
Esperson	791,424	2,162	61,380	54,219	68,644	60,785	57,474	55,350	66,519	72,856	72,203	76,809	77,760	67,425
Hankamer	259,108	708	26,815	25,411	27,663	24,904	23,343	22,500	20,681	19,035	18,309	19,308	18,026	13,113
Hardin	1,638,949	4,478	151,497	156,882	174,740	169,164	162,409	120,930	108,409	118,062	135,359	139,250	100,259	101,988
Hull	2,110,242	5,766	156,767	147,491	160,968	161,148	180,296	170,670	169,071	175,804	172,546	182,418	242,940	190,123
North Dayton	19,164	52	1,984	1,809	1,860	1,890	2,356	2,310	737	790	1,160	909	1,592	1,767
South Liberty	191,108	522	14,818	16,382	17,258	16,055	17,608	16,140	16,209	16,159	14,208	12,932	17,281	16,058
Martha	85,665	234	7,285	6,753	7,425	7,247	6,882	5,790	5,253	4,560	5,020	5,764	5,582	18,104
Total	5,165,929	14,115	428,792	416,608	466,772	449,305	456,289	398,490	393,025	412,336	423,698	441,218	467,160	412,236
MATAGORDA COUNTY—														
Bay City	825,355	2,255	81,065	72,857	77,596	71,736	87,358	72,870	55,713	68,793	70,576	56,578	63,000	47,213
Buckeye-Wilson Creek	81,056	221	3,038	3,944	4,433	4,470	6,231	9,540	4,513	8,788	4,314	9,524	8,280	13,981
Markham	354,159	968	23,839	34,072	33,080	32,518	38,998	35,100	27,134	24,740	24,091	23,974	29,612	27,001
Van Vleck	1,151,919	3,147	81,220	109,041	111,442	107,476	102,726	84,000	75,314	69,579	125,434	130,320	93,930	61,437
Miscellaneous	85,454	233	9,579	6,950	6,127	6,122	10,726	8,670	4,942	5,094	5,908	6,711	6,689	7,936
Total	2,497,943	6,825	198,741	226,864	232,678	222,322	246,039	210,180	167,616	176,994	230,323	227,107	201,511	157,568
MONTGOMERY COUNTY—														
Conroe	9,303,006	25,418	652,829	591,305	875,524	824,223	785,974	786,630	613,379	562,830	537,760	947,986	1,070,070	1,054,496
ORANGE COUNTY—														
Orange	892,078	2,437	79,515	74,804	77,619	74,513	71,734	72,840	63,703	61,468	87,984	89,857	71,732	66,309
Port Neches	317,449	867	27,125	21,791	31,320	33,279	31,387	26,760	23,042	25,775	25,431	26,057	25,115	20,367
Total	1,209,527	3,305	106,640	96,595	108,939	107,792	103,121	99,600	86,745	87,243	113,415	115,914	96,847	86,676
POLK COUNTY—														
Ace	141,367	386	15,810	9,584	14,202	13,983	14,942	11,970	10,878	10,867	10,095	11,010	10,710	7,316
Livingston	609,580	1,665	27,125	53,907	55,884	56,098	51,708	49,830	50,694	49,987	49,975	51,835	54,660	57,877
Segno	1,555,050	4,249	104,439	91,144	128,193	125,975	103,788	99,540	124,706	138,470	157,001	193,792	153,090	134,912
Total	2,305,997	6,301	147,374	154,635	198,279	196,056	170,438	161,340	186,278	199,324	217,071	256,637	218,460	200,105
SAN JACINTO COUNTY—														
Shepherd	1,809	15	.....	.....	.....	.....	.....	.....	.....	.....	423	961	270	155
TYLER COUNTY—														
Spurger	827,145	2,260	53,971	37,708	55,943	60,784	52,359	42,690	42,073	40,547	126,735	135,762	100,921	77,652
WASHINGTON COUNTY—														
Brenham	9,899	27	837	878	908	928	992	1,050	861	485	737	581	898	744
Clay Creek	134,418	367	12,183	11,045	12,489	12,562	12,028	11,490	10,122	9,245	8,893	12,823	9,210	12,328
Total	144,317	394	13,020	11,923	13,397	13,490	13,020	12,540	10,983	9,730	9,630	13,404	10,108	13,072
WALLER COUNTY—														
Brookshire	225	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	43	120	62
Katy	75,961	207	10,447	6,913	6,559	6,373	6,510	6,000	5,953	5,916	5,320	5,420	5,213	5,337
Total	76,186	208	10,447	6,913	6,559	6,373	6,510	6,000	5,953	5,916	5,320	5,463	5,333	5,399
WHARTON COUNTY—														
Boling	468,407	1,280	48,329	43,039	41,205	37,919	42,408	36,600	36,499	34,581	33,496	33,991	41,187	39,153
Hillje	71,157	194	744	494	.....	2,505	4,092	3,240	6,070	5,363	8,480	13,450	10,382	16,337
Louise	352,715	964	29,977	26,366	28,649	29,024	37,070	29,160	26,193	22,278	24,338	33,843	34,259	31,558
Magnet	470,671	1,286	42,966	45,574	49,248	47,460	41,478	36,270	32,650	31,945	32,940	34,616	34,170	41,354
Withers	1,722,633	4,707	168,299	167,576	179,054	172,428	162,998	146,700	121,915	114,574	112,553	123,456	105,210	147,870
Pickett Ridge	622,547	1,701	58,683	57,075	61,981	57,769	58,621	48,210	44,574	43,293	46,470	48,157	43,922	56,792
Miscellaneous	14,648	48	.....	.....	155	1,300	2,418	1,260	1,624	1,160	2,085	2,067	1,340	1,240
Total	3,725,779	8,471	348,998	340,125	360,292	348,405	349,085	301,440	269,525	253,194	260,362	289,580	270,470	334,304
Total	82,905,788	226,519	7,320,046	6,720,210	7,785,307	7,636,298	7,413,995	6,535,420	5,942,270	5,865,783	6,323,145	7,110,129	7,070,328	7,182,859
Daily average	226,519	.....	236,130	231,731	251,138	254,543	239,161	217,847	191,686	189,219	210,772	229,359	235,677	231,703

pleted as a distillate producer at 8,814-16 ft. The structure reecived its first crude production with the completion of the company's 3-A-248 State which flowed pipe-line oil from perforated casing at 10,327-43 ft. Approximately four rigs are being used by the company in developing these leases while another rig is located at the Fisher's Reef field, about 7 miles due north where production was obtained by perforating casing in the Frio at 8,961-63 ft. The latter field has been defined in several directions which has curtailed any large-scale drilling program.

Lower Frio Fields

The search for lower Frio production continues to be rewarded with success as an important strike appears to have been opened with the discovery of the Rowan field, 7 miles southwest of Alvin in Brazoria County. The discovery well, Rowan & Nichols 1 Hubbard was completed through perforated casing at 8,538-84 ft., while distillate production from another sand section was opened at approximately 8,900 ft. Only one dry hole has been recorded for the structure and the field is expected to show a gain in operations.

The presence of producing sands in the lower Frio is leading to deeper exploration, and resulted in a new producing depth record being established in the Bailey's Prairie prospect where Glenn H. McCarthy 1 W. B. Munson flowed gas and distillate from perforated casing at 11,615-49 ft. The operator opened the same type of production in the Chocolate Bayou field in the same county with 1 Andrau which was completed at 11,409-12 ft. This is a fairly new type of play for the district inasmuch as most of the Frio sand wells were usually abandoned as dry after drilling more than 250 ft. into the section.

The opening of Frio production in the Dyersdale area, Harris County attracted much attention. Located several miles updip from previous Frio production, H. C. Cockburn et al completed 1 Burkett in sand at 4,068-83 ft., and the well flowed 22.2 gravity oil. While no salt has been encountered the type of production and reaction of the wells indicate that the structure overlies a salt plug, and the producing district expected to be confined to a small area.

TEXAS GULF COAST

Field Developments in 1940

	No. wells Jan. 1, 1940	No. wells Dec. 31, 1940
Austin:		
Raccoon Bend	164	164
Brazoria:		
Anchor	1	8
Damon Mound	34	36
Danbury	12	11
Hastings	672	685
Lochridge	41	44
Manvel	170	178
Old Ocean	43	76
Rowan	0	7
W. Columbia	108	127
Chambers:		
Anahuac	302	339
Barbers Hill	158	163
Cedar Point	13	17
Cotton Lake	9	9
S. Cotton Lake	36	50
Lost Lake	8	8
Seabreeze	5	11
Turtle Bay	33	36
Willow Slough	6	10
Fort Bend:		
Big Creek	23	27
Blue Ridge	47	49
Orchard	17	15
Sugarland	51	51
Thompson	272	331
Rosenberg	1	2
Galveston:		
Caplen	4	10
Dickinson-Gillock	202	214
High Island	58	62
Hitchcock	14	13
League City	22	27
Hardin:		
Ariola	11	9
Batson	206	208
Saratoga	245	247
Silsbee	44	47
Sour Lake	166	140
Harris:		
Bammel	14	15
Clear Lake	23	56
Fairbanks	258	282
Goose Creek	83	88
Humble	277	258
Mykawa	29	28
Pierce Jct.	79	73
Satsuma	15	12
S. Houston	94	95
Tomball	428	437
Dyersdale	0	9
Houston:		
Kittrell	16	16
Jackson:		
Cordele	42	44
Francitas	7	8
Ganado	3	12
Mauritz	4	8
Lolita	0	57
West Ranch	50	221
Jefferson:		
Amelia	115	114
Clam Lake	7	13
Fannett	20	34
Lovells Lake	34	69
Nome	42	43
Spindletop	153	145
Beaumont	48	57
S. China	3	16
Liberty:		
Cleveland	11	10
Esperson	52	61
Hankamer	37	34
Hardin	140	158
Hull	176	181
Martha	4	7
N. Dayton	10	8
S. Liberty	40	41
Matagorda:		
Bay City	38	44
Buckeye-Wilson Creek	4	5
Markham	30	48
Van Vleck	In Bay City	
Montgomery:		
Conroe	942	935
Orange:		
Orange	17	39
Port Neches	14	19
Polk:		
Ace	7	8
Livingston	86	86
Segno	70	103
San Jacinto:		
Shepherd	0	1
Tyler:		
Spurger	27	44
Washington:		
Brenham	24	24
Clay Creek	50	54
Waller:		
Brookshire	1	1
Katy	11	10
Wharton:		
Boling	89	93
Hillje	1	14
Louise	31	41
Magnet	41	60
Withers	168	227
Pickett Ridge	33	45
Total	7,234	7,947

Miscellaneous Fields

County and field—	Prod.	Dly. av.	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Brazoria:				
Bailey's Prairie	203	7	0	0
Allen	959	8	1	1
Chocolate Bayou	38,322	105	1	1
Sandy Point	18,797	51	4	1
Chambers:				
Fig Reef	10,250	28	0	1
Fisher's Reef	851	14	0	1
Red Fish Reef	3,886	65	0	1
Colorado:				
Garwood	461	5	2	0
Sheridan	28,161	143	0	3
Galveston:				
Alta Loma	13,188	87	0	2
Green's Lake	18,561	50	1	5
Harris:				
Aldine	15,648	43	1	1
Clinton	46,700	128	8	8
Ogburn	10,276	56	0	3
Jackson:				
Edna	1,079	3	5	6
Texana	7,291	27	0	2
Ganado	2,551	27	0	1
Jefferson:				
Cheek	1,168	39	0	0
La Belle	10,285	28	3	8
Matagorda:				
Armour	34,041	93	3	4
Blessing	510	9	0	1
Buttermilk Slough	4,420	12	1	1
North Markham	34,493	94	2	4
Palacios	11,990	33	4	3
Wharton:				
East Bernard	716	1	0	1
Lissie	434	7	0	0
Mackey	13,599	44	0	1

TEXAS GULF COAST DISTRICT

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	97	72	20,619	22	3
February	91	69	19,550	21	1
March	125	100	28,854	21	4
April	106	75	22,487	25	6
May	107	86	24,663	20	1
June	117	97	28,686	17	3
July	112	97	22,995	15	5
August	90	71	24,052	17	2
September	109	86	22,664	19	4
October	103	79	22,756	20	4
November	103	83	26,199	18	2
December	72	62	17,671	9	1
Total 1940	1,232	977	281,196	224	31
Total 1939	1,365	1,053	315,651	250	62
Difference	133	76	34,455	26	31

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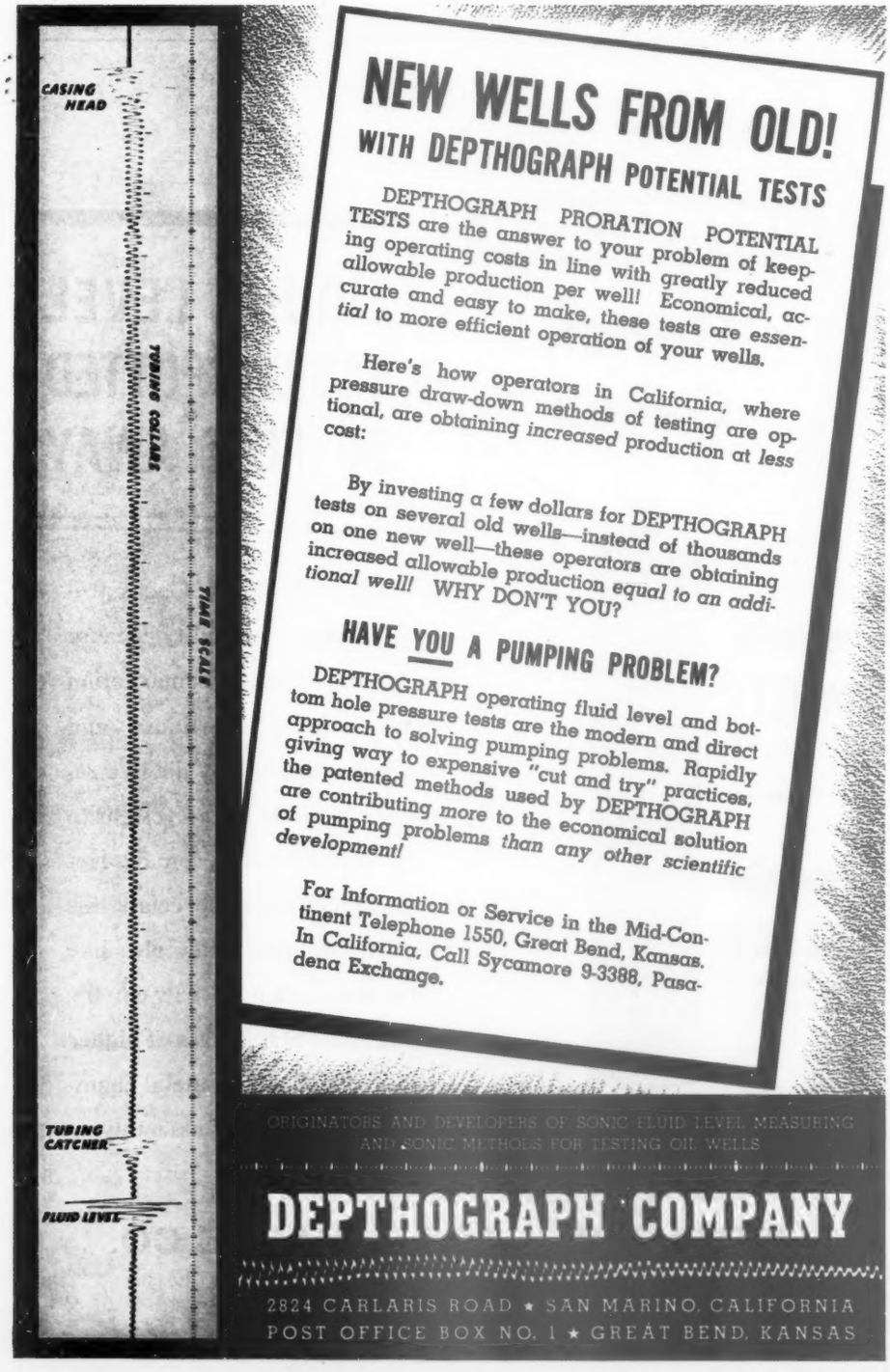
Turner Valley Extensions Give Canada Record Production

By VICTOR LAURISTON

CANADIAN petroleum production in 1940 established a new high, with an estimated total of 8,722,215 bbl., approximately 885,000 bbl. in excess of the previous high—for 1939—of 7,837,503 bbl.

Comparative figures for the various Canadian provinces are:

	Barrels	
	1939	1940
New Brunswick	20,101	18,817
Ontario	205,978	190,784
Alberta	7,594,411	8,495,473
Northwest Territories	17,013	17,141
Total	7,837,503	8,722,215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Natural-Gas Production

Figures of natural-gas production for the various provinces for 1940 are not complete, but careful estimates indicate a slight increase over 1939. Comparative figures are as follows:

	Cubic feet	
	1939	1940
New Brunswick	610,500,000	625,500,000
Ontario	11,700,000,000	11,760,000,000
Alberta	22,775,000,000	22,880,000,000
Manitoba	600,000	600,000
Saskatchewan	100,000,000	105,000,000
Total	35,187,600,000	35,371,100,000

Figures for December 1940 are estimated and subject to revision.

Alberta Fields

Despite conservation measures, the Turner Valley field in Alberta continued to increase its production. Outside Turner Valley, the most important new production was in the Vermilion field. The small outlying pools in some cases showed increases over 1939. With December figures estimated, Alberta fields in 1939 and 1940 compare as follows:

	Barrels	
	1939	1940
Turner Valley limestone crude	7,180,161	8,100,513
Turner Valley limestone gas wells	70,650	75,383
Turner Valley absorption plants	296,787	273,012
Turner Valley shallow crude	8,431	7,194
Red Coulee light crude	13,022	12,158
Wainwright heavy crude	11,624	7,638
Dine-Ribstone heavy crude	4,317	5,146
Vermilion heavy crude	.....	9,256
Lloydminster heavy crude	548	1,576
Del Bonita light crude	2,365	3,246
Moose Dome light crude	2,074	351
Taber medium crude	3,745	.....
Steveville light crude	687	.....
Total	7,594,411	8,495,473

So far as drilling was concerned, the year was an exceptionally active one. During the year there were 36 completions, all of them crude producers. The field closed the year with a total of 130 crude wells, including three on test but definitely productive. The new producers included some of the largest wells yet drilled. In addition, there are 101 wells rated as gas producers, from which naphtha is recovered by separators and whose residual wet-gas output is treated in four gasoline absorption plants. For these, the Alberta Conservation Board sets definite allowables from month to month in accordance with the market demand for natural gas, the December allowable approximating 130,672,079 cu. ft. a day.

In 1939 drilling to the west and south pretty well fixed the limits of the original west-flank crude area—the so-called southwest field; and during 1940 this area was pretty well drilled out except for Township 18-2w-5 in the extreme southwest, which is being systematically tested by the Northwest-Hudson's Bay organization.

Meanwhile, the West Central area in Township 19 has been extended in several directions, the gap between that area and North Turner Valley has been narrowed, and the latter field has been extended still farther north. The most significant West Central well was probably Arrow Royalties 1, LSD 16, 13-19-3w5, for a time the second largest producer in the field, and which opened an important new area for development. Another well pioneering an extension of the field was Calmont-Northwest 1, LSD 3, 18-19-2w5. Southwest Petroleum 3, LSD 3, 8-19-2w5, proved the west end of that section for crude. Toward the close of the year, drilling was active in Section 24-19-3w5, with one test, Anglo-Phillips 2, as far north as LSD 9, 35-19-3w5. This brings the active drilling within 3 miles of the nearest North Turner Valley producer. How far west the West Central field may extend remains to be determined.

An interesting link between the West Central and North fields is Harris Royalties 3, LSD 16, 3-20-3w5, where a producer would pretty definitely prove the continuity of the crude production.

North Turner Valley provided the most spectacular developments of 1940. South and west of the proven field, Anglo-Phillips 1, LSD 14, 15-20-3w5, encountered the water zone in the lower lime, but secured a good production from the upper horizon. In the far north, Alberta Oil Incomes 1, LSD 4, 34-20-3w5, pioneered a new area to bring in a large producer, starting with 900 bbl. a day allowable. Alberta Oil Incomes 2, LSD 4, 4-21-3w5, pushed the field still farther north and started at 1,065 bbl. Meanwhile, Home Oil Co. pushed the development of its North Turner Valley holdings, with four good wells completed; and Foothills Oil & Gas Co. continued the development of 27-20-3w5, its

(Continued on Page 160)

BRADFORD DISTRICT HAS BUSY YEAR; DEEP TESTS EXTEND GAS FIELDS

DEVELOPMENTS were few in the upper district of the Pennsylvania fields during the year.

The longitudinal limits of the Music Mountain pool, south of the Bradford field, were believed defined in March when a number of dry holes were drilled southwest of the previously proven limits. Later in the year a well was drilled southwest of the pool with reported production similar to those in the pool area. However, it was capped and the exact production not learned.

Although several test wells were drilled no gas pools were located in the area. Eight wells were drilled along Muddy Creek in Crawford County. One was dry and the others had a small initial open flow. One well was drilled in the Union City area of Erie County and had a small show of gas. A deep test was started late in November in Erie County near the Ohio State line.

In the northern Oriskany sand gas fields several pools were opened on the New York side of the field. At the end of the year there were no active operations on the Pennsylvania side.

Empire Gas & Fuel Co.'s Sam Crandall opened a new pool in Independence Township, Allegany County, in April. The well blew wild for 3 weeks before it was brought under control. It had a flow of 50,000,000 cu. ft. Another pool was opened later in West Union Township, Stueben County. Several good wells were brought in in Allen Township, Allegany County. That area had been tested some years ago but neglected when pools were located elsewhere. Presence of gas in the Elmira district was indicated later in the year.

SOUTHWEST PENNSYLVANIA

In spite of additional exploration and a 26 per cent increase in total completions, the year 1940 added nothing to oil reserves in the lower eastern fields to overcome normal depletion. Runs from wells in these districts have been steadily declining. The high lifting costs in these fields and the crude-price structure remaining below the considered norm influence considerable of the new work which sought additional gas pools, extensions or new horizons.

In Southwest Pennsylvania a test on the James Tennis farm in South Beaver Township, Beaver County, on a tested Oriskany closure in which the gas was becoming exhausted, was deepened to the Clinton sand and bottomed in the Queenston shale at 6,823 ft. It was the first Clinton sand test in Southwest Pennsylvania and found no evidence of the Newburg horizon and also the Clinton and Medina hard and void.

On Chestnut Ridge in North and South Union townships, Fayette County, two additional wells were completed in the Oriskany sand. They were the 1 Piedmont Coal Co. (New Development Co.) and the 2 Piedmont Coal Co. (Peoples Natural Gas Co.). Both exceeded 2,000,000 cu. ft. of gas a day from the Onondaga chert beds and the Oriskany sand. Also, two wells, 1 and 2 Summit Hotel (Heyn) were deepened from the Onondaga cherts beds through the Oriskany sand and found added gas.

On Laurel Ridge, the test of the New Penn Development Co. on the Gregg L. Neel farm in Stewart Township, Fayette County, reached a depth of 8,004 ft. (cable tools) and shut down. It is believed that it is bottomed on the downthrow side of the major fault which is known to have a throw of 600 ft. The lower Devonian markers were not reached. This test may be deepened.

In Maryland, the test on the Humberson or Scharzer farm on the Accident dome in Garrett County is also shut down as the hole deviated from vertical at about 5,000 ft. and it has been so far impossible to straighten it so as to afford action of the tools.

In more shallow Pennsylvania drilling in gas areas, extensive work was done in Armstrong and Indiana counties with mostly small wells resulting. A few good strikes were made in Fayette and Greene counties. The spotty gas field in Menallen Township, Fayette County, has now moved southwest into Monongahela Township, Greene County, where several wells over 1,000,000 cu. ft. a day have been completed in the Injun sand.

EASTERN FIELDS

Summary of Wells Completed for 1940

Field—	Comp.	Oil	Prod.	Dry	Gas
Bradford	3,004	3,004	5,611	0	0
Allegany	890	889	1,037	1	0
North Oriskany	79	0	0	52	27
Middle district	201	176	271	7	18
Butler-Armstrong	67	37	113	11	19
S.W. Pennsylvania	318	25	201	66	227
Southeast Ohio	537	336	3,052	89	112
West Virginia	725	120	916	118	487
Total	5,821	4,587	11,201	344	890

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	441	351	1,050	28	62
February	483	401	751	15	67
March	439	368	1,572	18	53
April	477	403	1,326	33	41
May	581	485	1,156	23	73
June	554	478	955	33	43
July	547	436	804	34	77
August	527	403	907	37	87
September	437	338	709	29	70
October	446	325	630	30	91
November	434	305	748	28	101
December	455	294	593	36	125
Total 1940	5,821	4,587	11,201	344	890
Total 1939	4,392	3,289	44,115	332	771
Difference	1,429	1,298	32,914	12	119

SOUTHWEST PENNSYLVANIA

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	26	4	16	7	15
February	20	3	30	5	12
March	20	1	5	5	14
April	18	4	10	4	10
May	30	2	60	6	22
June	16	1	1	5	10
July	19	1	15	4	14
August	34	1	10	8	25
September	22	2	4	7	13
October	36	4	47	7	25
November	33	2	3	2	29
December	44	0	0	6	38
Total 1940	318	25	201	66	227
Total 1939	210	25	241	48	137
Difference	108	0	40	18	90

WEST VIRGINIA

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	49	9	109	7	33
February	51	11	56	4	37
March	48	13	56	5	30
April	37	10	73	8	19
May	50	9	84	4	37
June	51	13	93	14	24
July	67	9	65	13	45
August	79	11	85	13	55
September	58	7	41	6	45
October	73	9	77	14	50
November	71	11	129	13	47
December	91	9	48	17	65
Total 1940	725	120	916	118	487
Total 1939	619	110	1,956	90	419
Difference	106	10	1,040	28	68

WEST VIRGINIA

Again new oil production proved scarce and insufficient to overcome depletion and the lack of cleaning out due to the present price structure. Fair results were obtained in proven gas fields and extensions of the Oriskany gas pools.

The extension into lower Jackson County of the Elk-Poca Oriskany gas field in Kanawha County was very successful. Wells were completed with volumes up to 20,000,000 cu. ft. gas a day and the field is extending. A most extreme northwest test on the B. B. Meadows farm in Ripley district is now being completed. The gas volume is small in the Oriskany and at present uncommercial but it may improve with shot.

North in Grant and Ravenswood districts, Jackson County, several Oriskany tests were completed presumably unconnected with the Kanawha fields as shown by geophysical research. On the Henry Morrison farm in Grant district a well gaging 400,000 cu. ft. a day was completed. The test on the C. E. Andricks farm in Grant district was slightly smaller. The test on the P. F. Riggs farm in Ravenswood district was good for 6,000,000 cu. ft. of gas a day after shot and was bottomed at 5,042 ft. More deep tests are driling which are not centered as offsets.

In Kanawha County, 4 Campbells Creek Coal Co. in Louden district was deepened from the Oriskany sand, in which it had been a gas well, to the Clinton sand and found a volume of 1,000,000 cu. ft. of gas a day from that formation. Northwest in the Elk-Poca field, two wells are being deepened to the Clinton sand on the John Price farm and the Copenhaver heirs farm. The former is now drilling through the Clinton sand which at 6,675 ft. is still void of any showing.

In Harrison County a deep rotary test on the C. S. Gribble farm in Grant district which found the Oriskany sand dry (drill-stem test) is now 9,786 ft. deep and possibly in the Clinton sand.

A possible but spotty Injun sand oil pool is being developed in Birch district, Braxton County, where gas well are producing oil in such quantity as to warrant added drilling. The two best producers are on the A. L. Morrison and Ed L. Boggs farms. In Otter and Buffalo districts, Clay County, several very good Injun sand gas wells were completed and more drilling is under way.

In Wetzel County, a large Gordon sand gas well was completed on the William Shafer farm in Proctor district. In Putnam County, new gas extensions are under way in Curry and Teays Valley district with some very fair gas wells in the Salt sand and Big lime. Normal routine work has been carried on in all sections with new gas production, now in heavy demand, getting the play.

●

Annual Review Kansas Fields

(Continued from Page 146)

	Production	Daily average	No. wells Jan. 1 1940	No. wells Dec. 31 1940
Wilson	17,447	47	5	0
Ark City	2,269	6	0	1
Others	1,923	5	3	3
Greenwood County:				
Seeley-Wick:				
De Malorie-Lowder	251,204	686	126	126
Hamilton	100,411	274	94	96
Madison	181,215	495	102	102
Seeley-Wick	262,087	716	329	328
Miscellaneous:				
Blackwell	2,221	6	5	5
Brinegar	6,067	16	31	31
Christy	4,282	11	11	10
Eureka	19,704	53	15	15
Gaffney	10,716	29	3	3
Hinchman	16,258	44	13	13
Jackson	1,617	4	2	2
Reese	45,440	124	21	22
Willard	13,905	37	3	5
Faukhouser	50,012	136	65	65
Batesville	636	2	1	1
Big Sandy	10,596	28	20	20
Evans	2,947	8	2	2
Hoagland	21,951	59	16	20
Wiede	9,979	27	12	8

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	94	74	25,022	17	3
February	104	86	24,658	14	4
March	126	100	37,125	23	3
April	148	122	37,667	22	4
May	175	131	51,596	37	7
June	225	172	59,386	46	7
July	148	112	32,367	29	7
August	195	162	65,448	28	5
September	132	96	36,567	31	5
October	174	138	52,139	34	2
November	154	119	133,179	25	10
December	142	98	93,506	36	8
Total 1940	1,817	1,410	648,660	342	65
Total 1939	1,358	977	422,394	309	72
Difference	459	433	226,266	33	7

INDIANA'S PRODUCTION TRIPLED BY GRIFFIN; OHIO GAS FIELDS ACTIVE

DEVELOPMENT and extension of the Griffin pool in Gibson and Posey counties accounted for most of the drilling in Indiana in 1940 and were responsible for a decided increase in the total number of operations. The year's only discovery, a pool near Vincennes in Knox County, proved a disappointment.

The Griffin pool was discovered in the last days of 1938 with good production from the McClosky lime. Development soon opened pays in a number of other formations, notably the Cypress sand and the Waltersburg sand. A few light wells have been completed in the Tar Springs sand and the Paint Creek and Bethel and other sands.

Productive area of the pool was extended several times during the year and it was responsible not only for a gain in field operations but was also the chief factor in the growing importance of Indiana in the production picture.

The Vincennes pool was opened in October by W. C. McBride 1 Winckler, SW SW SW 24-2n-11w, which flowed 492 bbl. from the McClosky lime. However, further drilling established that there was no general structural trend and a number of dry holes were drilled.

For the 12-month period a total of 504 wells were drilled in the state. Of these 231 were oil wells with an aggregate initial production of 32,124 bbl. per day. 53 were gas wells and 220 were dry holes. Thus the total number of operations was up from 1939 when 371 wells were drilled of which 178 were oil wells and 156 were dry holes.

The increase in operations was a continuation of a trend that began 2 years ago, when there were only 157 completions in all.

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	29	17	2,160	9	3
February	21	9	724	10	2
March	31	14	1,150	15	2
April	32	14	1,265	15	3
May	43	10	985	29	4
June	37	14	1,956	20	3
July	33	16	2,221	17	0
August	66	36	4,816	23	7
September	46	26	4,962	14	6
October	68	32	5,306	23	13
November	53	29	4,771	20	4
December	45	14	1,808	25	6
Total 1940	504	231	32,124	220	53
Total 1939	371	178	27,449	156	37
Difference	133	53	4,675	64	16

OHIO

OHIO witnessed increased activity during 1940 over the previous year in wells drilled in the old fields and in wildcat testing. One thousand two hundred and twenty-seven tests were completed (exclusive of water-flooding-project wells), resulting in 323 oil wells with an initial production of 4,596 bbl., 504 gas wells and 400 dry holes. All sections of the state were given tests to the various horizons.

Eastern Ohio

The eastern half of the state was the focal point in the seismograph work and the none-too-successful wildcat drilling. Tests in Ashtabula, Lake, Geauga, Columbiana and Noble counties found the Clinton void of commercial production. The Oriskany was tested in Harrison County and found water. Some encouragement was had in Tuscarawas County with small gas successes in the Clinton sand at the 5,000-ft. level.

Considerable acreage is under lease in the eastern portion of the state and further testing is anticipated. Deep tests are now under way in Mahoning and Belmont counties in the southeastern section where structural conditions are more pronounced than in the northeastern section.

Central Ohio

In the Central Ohio fields drilling was confined primarily to the extension of existing fields. The Newark gas pool (Clinton sand) in Licking County led with 78 gas wells being completed as against 28 dry holes. The wells average 800,000 cu. ft. and range up to 3,000,000 cu. ft. Knox and Muskingum counties were active in Clinton sand drilling with mainly gas successes resulting.

The Clayton pool in Perry County is the outstanding Clinton sand oil development, 25 oil wells being completed with initial productions ranging up to 160 bbl. The present outlook is promising and immediate further development is planned by the operators in the field.

Water-flooding operations in the Berea sand in the Lodi (Chatham) pool in Medina County continued with over 300 output and input wells being completed. Several new projects will be undertaken during 1941.

In the deeper drilling a Trenton test in Muskingum County and sub-Trenton tests in Knox and Franklin counties proved unsuccessful. A Licking County test is at present exploring the sub-Trenton horizons.

Southeastern Ohio

The southeastern section yielded its annual crop of shallow oil and gas wells, topped by a 37,500,000-cu. ft. gas well in Athens County. A rock pressure of only 37 lb. and dry offset tests tend to indicate the well is a freak. The Ohio shales in lower Meigs County were tested with some gas successes resulting. Further development here can be expected.

Western Ohio

Activity in the western part of the state, including the old Lima field, was at a minimum. Scattered tests were drilled to the Trenton with minor gas and oil successes, notably in Van Wert County. A St. Peter test in Clinton County in southwestern Ohio was unsuccessful.

Completions by Months

Month—	Comp.	Oil	Prod.	Dry	Gas
January	57	8	85	21	28
February	59	20	340	14	25
March	72	22	221	27	23
April	92	31	467	28	33
May	117	46	601	39	32
June	104	28	334	42	34
July	134	43	403	38	53
August	108	26	539	42	40
September	95	22	304	33	40
October	145	32	473	39	74
November	113	18	519	36	59
December	131	27	250	41	63
Total 1940	1,227	323	4,596	400	504
Total 1939	1,034	183	3,505	352	489
Difference	193	140	1,091	48	15

KENTUCKY

Operations in Kentucky during 1940 were highlighted by the discovery of a minor pool in the Hebbardsville district of Henderson County and the undertaking of a deep-drilling campaign in the eastern part of the state.

Although a number of wells were drilled in the Hebbardsville district, only five producers were completed spotted about the area. Continued drilling is in prospect for the coming year, however. This discovery was chief reward of nearly 3 years of exploration and leasing in western Kentucky, chiefly in the province of the eastern interior coal basin which lies immediately west of the Cincinnati arch.

Deep drilling was spurred by discovery of gas in sands from 3,500-4,000 ft. in Clark and Martin counties. During the last few weeks of the year attention was centered on Johnson County where leasing was heavy following the completion of a gas well by S. C. Allen on the Albert Horn land at a total depth of 2,319 ft.

Activity fell off considerably during the year as compared to 1939. Only 583 wells were drilled in the state, as compared to 734 during the previous year. Of the total drilled this year, 224 were oil wells with a total initial production of 13,581 bbl. daily, and 231 were gas wells.

Field development was fairly well localized during the year in the Handyville district of Daviess County, the Utica pool of the south central part of Daviess County, the Ohio County fields and other oil-producing areas.

Completions by Months

	Comp.	Oil	Prod.	Dry	Gas
January	27	14	980	11	2
February	29	14	660	10	5
March	29	9	335	13	7
April	44	12	482	21	11
May	45	23	682	14	8
June	55	8	844	31	16
July	48	24	1,423	18	6
August	74	32	2,168	29	13
September	58	31	2,802	22	5
October	48	33	1,440	10	5
November	59	18	1,412	25	16
December	67	6	353	27	34
Total 1940	583	224	13,581	231	128
Total 1939	734	275	14,847	312	147
Difference	151	51	1,266	81	19

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(Continued from Page 158)

No. 5, LSD 13, ranking in December as the largest producer in the field.

It is officially estimated that the 130 crude producers already completed represent approximately half the number of wells that can be drilled in the Turner Valley crude area, though there are possibilities that the field may widen or extend farther to the north.

Steveville Field

The Steveville field, 110 miles east of Calgary, where gas was developed in large quantities in 1939, was further tested, with Standard Oil of British Columbia the most active company. Standard 2 Princess, LSD 3, 13-20-12w4, was carried 4,250 ft. to test the Devonian limestone, encountering sulfur water; but tests of the Madison limestone between 3,225 and 3,325 ft. resulted, on December 30, in a flow of 168 bbl. a day of 25-gravity crude, with a gas flow estimated 5,000,000 cu. ft. a day. If this well fails to develop water trouble, the bane of drillers in the Alberta plains area, an important new oil field is expected.

Vermilion Field

The year was marked by a new development of some importance in the area south of Vermilion, in eastern Alberta. Already proven by the completion of Battleview Oils 1 as a large gasser, the resumption of development was marked by the encountering of heavy crude in Battleview 2, LSD 13, 20-50-5w4, at 1,849 ft. The field was very active in the latter part of the year and additional completions included seven potential crude producers and two gassers. With a production exceeding 9,000 bbl. in a few months, though most of the wells were shut in, the field ranked next to Red Coulee and is probably the largest potential producer in Alberta outside Turner Valley.

Ontario Drilling

Drilling in the Ontario fields during the year represented largely the efforts of the major natural-gas companies and associate interests to develop new fields or additional gas reserves in old fields. In the new Malahide field, in Elgin County, Union Gas Co. drilled 17 gassers and 6 dry holes. Central Pipe Line Co. drilled 11 gassers and 2 dry holes.

The Union Gas Co. continued systematic development of its Haldimand acreage, bringing in a number of small gassers; and similar results were secured by a number of small companies and syndicates in the Haldimand-Norfolk area. Efforts, largely by W. J. Atkins and the Dominion Natural Gas Co., to develop new production in townships adjacent to the Brownsville field were largely unsuccessful.

In Kent County, Union Gas Co. drilled five producers and three dry holes in its Chatham Township field. In the De Clute field, Union Gas Co. completed four producers, the largest with initial flow estimated at 3,000,000 cu. ft., and Gas Producers Syndicate drilled two producers.

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290 Tests Reached 10,000 Feet During the Past Year

By HARRY F. SIMONS

DRILLING rigs in the United States chalked up a total footage of almost 91,000,000 ft., or 17,235 miles, during 1940; but more impressive is the number of deep tests which were drilled in an effort to obtain production or determine the possibilities of the lower horizons. There were 290 tests drilled to below 10,000 ft. in coastal Louisiana, coastal Texas, California, Oklahoma, and Wyoming. The average depth of the wells drilled was slightly over 3,000 ft.

Areas in which deep tests and deep producing fields are common are shown by the accompanying table which gives the number of wells, total footage and average depth per well for the various areas of the United States. Districts with high well-depth averages include the Southwest and Gulf Coast of Texas, Louisiana Gulf Coast, Arkansas, and California. West Texas gets a high average because of the relatively large number of wells drilled to a depth of approximately 5,000 ft., while Utah is strictly a wildcat country and it is only natural that any test wells should be drilled to beyond the current possibilities before abandonment.

Deep Test Important

With the exception of the amount of weight which the hoisting machinery must handle, pump pressures, difficulties from heaving shale and similar troubles, drilling a 5,000-ft. test in a hard-rock area may be more costly and more difficult than a 10,000-ft. test in soft Tertiary rocks. The areas which are now characterized by deep wells obtain their production and do their drilling in geologically young formations. Wells in such areas can be drilled to their total depths of over 10,000 ft. in less time than it takes to reach 5,000 ft. in the regions where older formations are encountered.

The test of the Hope Natural Gas Co. in West Virginia is now nearing a depth of 10,000 ft. It was started 6 months ago and has been almost continuously active. Many wells drilling in the younger and softer formations in the areas close to the coast lines reach depths of 8,000 ft. in 20 days and beyond 10,000 ft. in 30 to 40 days.

The coming year will probably see deep drilling on a wider front than ever before as this is one of the main means open to the industry of establishing the possibilities of both new and already-productive areas. There is also the tendency of major companies and stronger independents not to abandon a well until they have either tested all the possibilities, have penetrated the complete sedimentary section, or have reached the physical depth limit of the machinery being employed.

The location of two deep tests east of the Mississippi River, which were still drilling at the end of the year, foreshadows a deep-prospecting campaign in that area. Michigan, Ohio, Illinois, West Virginia, Pennsylvania, and some of the other eastern states may get deep tests (7,000 to 10,000 ft.) in an effort to uncover more production in that area. The decline in Illinois production has strengthened the crude market and a comparatively high-capacity field could be easily accommodated.

TOTAL FOOTAGE AND AVERAGE DEPTH BY STATES IN 1940

	Wells	Total footage	Average depth
Eastern	5,821	11,834,291	2,033
Ohio	1,227	2,109,786	1,719
Indiana	504	900,648	1,787
Kentucky	583	601,662	1,032
Michigan	1,104	2,164,956	1,961
Illinois	3,814	9,424,425	2,471
Mississippi	210	1,018,967	4,852
Alabama	11	39,061	3,551
Florida	5	15,235	3,047
Georgia	2	4,381	2,191
Kansas	1,817	5,714,465	3,145
Oklahoma	1,834	4,903,742	2,674
North Central Texas	2,755	6,661,249	2,418
East Texas	621	2,432,891	3,918
West Texas	1,855	7,553,810	4,072
Texas Panhandle	560	1,677,860	2,996
Southwest Texas	2,071	8,703,210	4,202
Texas Gulf Coast	1,232	7,504,895	6,092
Louisiana Gulf Coast	989	6,826,473	6,902
North Louisiana	668	1,756,706	2,630
Arkansas	179	1,001,736	5,596
Nebraska	64	141,824	2,216
Missouri	38	31,569	831
Montana	234	611,074	2,611
Wyoming	179	583,468	3,259
Colorado	19	69,283	3,646
New Mexico	611	199,788	3,269
Utah	3	17,712	5,904
California	1,030	6,130,099	5,952
Total	30,040	90,635,266	3,017

The Rocky Mountain area, benefiting by improved markets, will also get some deeper drilling. In addition, there is the development in North and South Dakota expected for next year. The sedimentary section in the Dakotas runs from around 4,000 ft. to as much as 20,000 ft. A test in Sublette County, Wyoming, reached a depth of 10,003 ft. before being abandoned last year.

Deep development will continue to see its greatest employment in coastal Louisiana and Texas, where both crude oil and distillates are recovered from the deep pays. Some of the production in this area occurs as a distillate and the establishment of recycling plants will aid the development. In the other parts of Texas, North Central, West and East Texas, wells will also seek lower levels.

California will probably continue to compete with the Gulf Coast for deep-well honors. The state still holds the depth record and wells below 10,000 ft. are quite common. There are numerous fields in the state now producing from shallower horizons which may try for deeper sources of oil when the general situation justifies the increased outlay.

Last year the average well depth in Mississippi was 4,852 ft. and in Alabama it was 3,551 ft. The relatively high average for Mississippi was due to the drilling of the Tinsley and Pickens fields, where production is obtained from Cretaceous formations (Selma, Eutaw and Tuscaloosa). As development in this area continues and is extended into the Warrior basin, both Mississippi and Alabama may see deeper tests drilled.

Greatest factor in the advance of deep drilling has been the recent technical accomplishments of the drilling industry. Higher rotating speeds, greater weight on the bit, concentration of weight at the bottom of the drill stem, increased mud-pump capacity and better mud treatment has made it possible to drill wells to 10,000 ft. for the cost of drilling to 7,000 ft. a few years ago. Electrical-logging devices and gun perforators make it possible to locate and produce from thin sands at great depths. Without the over-all reduction in drilling time and costs, many of the deep wells would be financial failures.

1940 Deep Development

In California, the San Joaquin Valley and the Los Angeles Basin were particularly active in the deep drilling development. Most of the production is from wells drilled to the Eocene and Miocene formations. In the Northeast and Southeast Coalinga fields production is obtained from around 8,000 ft. and the Ten Section field is being developed at approximately the same depth. Some of the other fields which are definitely in the deep zone with producing or test wells drilled near or below 10,000 ft. are Kettleman North Dome, Coles Levee, Rio Bravo, Dominguez, Long Beach, Rosecrans, Inglewood, Greeley, Tupman, Strand, Wasco, Wheeler Ridge, Buena Vista Hills, and the Kreyenhagen district.

During 1940 there were 93 wells drilled in California that exceeded 10,000 ft. Many of these went beyond 11,000 ft. and some went beyond 13,000 ft. At the peak of activity, there were five wells completed in 1 week which totaled 57,097 ft., an average of 11,419 ft. per well.

Coastal Louisiana

An area of outstanding development in deep drilling was the coastal Louisiana fields. The average depth to the bottom of the pay zone in the 17 discoveries in that district was 8,668 ft. Production in these discoveries is from formations in the Miocene, Oligocene and the Tertiary Wilcox. There were 33 wells producing in these fields at the end of the year. An important deep discovery well was Tide Water Associated 1 Delta Farms in 6-17s-23e, La Fourche Parish, which produced from the Miocene at 11,290-11,305 ft. Together with Lake Salvador and West Bay discoveries, this well has encouraged further prospecting in the submerged lands along the Mississippi.

Nibletts Farm field in Jefferson Davis Parish was the deepest discovery in Louisiana during the year. The well, drilled by Continental Oil Co., produced from the Oligocene at 11,604-24 ft. Other fields discovering producing sands below 10,000 ft. in Louisiana were Schooner Bayou, Erath and Chenier Ridge. The first was discovered by Union Oil Co., the second by the Texas Co. and the last by Phillips Petroleum Co

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that the sands flanking the salt domes in the area carry good production. Some of the deep discoveries are adjacent to salt domes which received considerable shallow prospecting and had been given up as worthless until several years ago. The main problem now is to drill the wells at a low enough cost to make a profit.

In addition to the numerous tests drilled below 8,000 ft., coastal Louisiana had 136 wells which went to depths beyond 10,000 ft. Toward the latter part of the year, the deep work slackened but during the more active season five or six deep completions were not uncommon.

Texas Coastal Region

Together, Texas Gulf Coast and Southwest Texas accounted for 60 tests drilled beyond 10,000 ft.; the former district had 51 and the latter 9 deep holes drilled. Production in this area is also obtained from the younger formations, belonging to the Eocene or the Oligocene. The Frio-Vicksburg, Jackson, Clayborn and Wilcox are the more common producing horizons.

Nine of the discoveries of the year in the Texas Gulf Coast region were below 8,000 ft. and there was one well which obtained production from 11,615-49 ft. The production is from the lower Frio sand. Glenn H. McCarthy, the operator, also uncovered Frio production in the Chocolate Bayou field in Brazoria County at 11,402 ft.

In North Texas considerable attention was attracted to deep (deeper than usual) work in that area. Discovery of oil in several zones of the Bend (Pennsylvanian) formation at depths below 5,000 ft. were recorded and the lower Mississippian and upper Ellenburger (Ordovician) were found to be productive. Deepest discovery of the year was the Hults-Owen field in Montague County which produced 1,085 bbl. from the Nocona lime of the Bend formation at 6,016-50 ft.

The deep Stribling pool was the deepest in the West Central Texas district. The field is located in Stephens County and produces from the Mississippian lime at 4,588-4,694 ft.

Deep discoveries and deep development were recorded in the West Texas district as four of the fields uncovered there produced from below 5,000 ft. and a fifth obtained production below 6,000 ft. Practically each week of the year saw from 5 to 10 completions below 5,000 ft. listed in the area.

Two deep discoveries at Chapel Hill in Smith County, Texas, livened the year in the East Texas district. The two pools are only 1½ miles apart and may be linked later. One is producing from the Glen Rose in the Trinity at 8,036-58 ft. and the other is getting its production from the last break in the Pettit lime of the Trinity at 8,252-8,405 ft. Some wells are producing oil and some distillate. The Pittsburg pool in Camp County is producing from the Glen Rose at 8,000-42 ft.

Michigan's outstanding well of the year was a deep test, Gulf 1 Bateson in Bay County, which obtained production. The well caught fire while drilling was in progress near the close of the year, burned the derrick and drilling machinery and drew more attention to it. The well is unusual in that it was started several years ago with cable tools, was reported several times as having obtained production in the Dundee-Monroe formation and was temporarily abandoned. A rotary rig was installed, the hole cleaned out and a string of casing run preparatory to drilling deeper. When the test reached 7,776 ft. the mud blew out and the well caught on fire. A new rig was moved in and preparations made to drill deeper with the possibility the test may be carried to 10,000 ft. At the present time it is producing about 50 bbl. of oil and 5,000,000 cu. ft. of gas per day from either the Salina or the upper Niagaran (Silurian). If it is a successful completion, the well may open up a deep play in Michigan which so far has favored developing the comparatively shallow Traverse lime, generally found above 2,000 ft., and the Dundee lime which is generally found above 3,500 ft.

The deepest well in Illinois was a failure from the producing standpoint and it also indicated the limits of "deep drilling" in that state. It was the Pure Oil Co. 3 Stella Billington in the Cisne pool of Wayne County which went to a total depth of 7,207 ft. and topped the St. Peter sand (Ordovician) at 7,141 ft. A string of 9⅝-in. pipe was run to 3,225 ft. through the McClosky lime which is productive in the field. The test took almost 5 months to drill. While it is not located in the deepest part of the Illinois basin, it is close enough to limit deep drilling in that state to about 8 000 ft.

Oklahoma's deepest completion of the year reached its total depth in 1939 and was in the process of abandonment and testing of the upper pays for over 2 months. It was the Continental 1 Proctor in Washita County, and is the second deepest test ever drilled in the world. It points to the Anadarko basin as a possibility for deep drilling when conditions warrant.

Elsewhere, in Pennsylvania, New York, Ohio, West Virginia and the Rocky Mountain states, operators looked to the deeper levels as a source for oil. Ohio was not particularly successful in its attempt to obtain deep production. The other areas were rewarded with some gains. Kansas, while not strictly a reversal of the deeper development trend, has shown more of a tendency to look for pays higher up the hole. This is due to the fact that most of the production in the state comes from the Arbuckle lime, well down in the Ordovician, which is generally found between 3,000 and 4,000 ft.

There is some production obtained from the Cambrian and pre-Cambrian formations in Kansas. The Reagan and La Motte (Gorham) sands in the Cambrian and the granite wash at the top of the pre-Cambrian have been found productive, mostly in Russell County and to the northwest. This opens up the possibility of production below the Arbuckle in counties east of Russell, where the Arbuckle thickens considerably.

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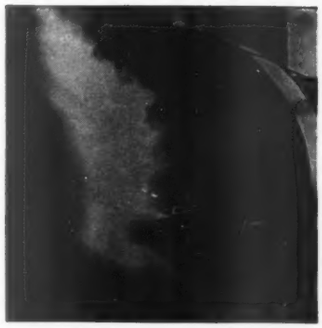

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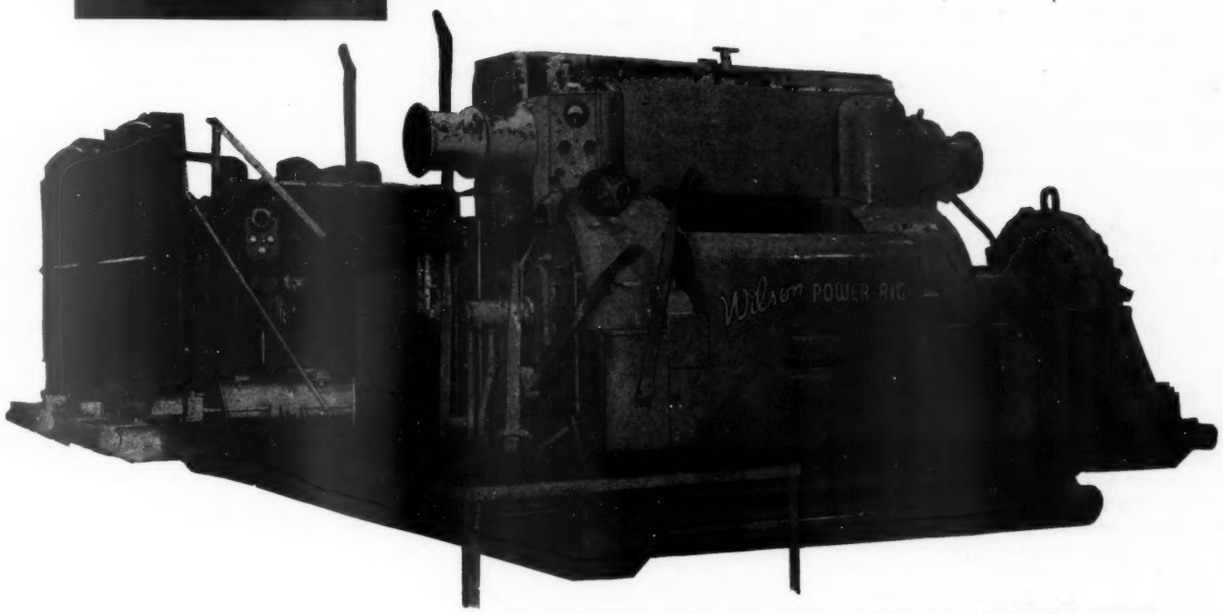

Above is shown the Wilson Atlas Model Power Rig—one of four outstanding models—capable of drilling 8,000 ft. of hole, using 4½" drill pipe.

Wilson Rigs provide the simplest and most convenient control arrangement ever developed on any rotary drilling rig; a positive acting friction latch on the hand brake lever which permits locking of brake lever in any position; water-cooled friction clutches on drum drive, affording 5½ times more holding power than that of any other clutch. A new convenience is the quick acting cover on all chain guards. By simply turning the hand screws which clamp the cover to the chain guard, the cover may be removed in a matter of seconds as compared to minutes heretofore. Another modern Wilson time saver!

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Exports Fall to 18-Year Low As Imports Gain 35 Per Cent

By J. P. O'DONNELL

A decline of approximately 56,000,000 bbl. in United States petroleum exports and an increase of 35 per cent in imports for 1940 had an unprecedented influence on the domestic industry.

Dislocation of the European market was particularly severe. Spread of the war practically eliminated western European, Scandinavian and Mediterranean countries as customers.

Suppression of civil consumption throughout the Eastern Hemisphere reduced consumption of all countries.

NEW YORK, Jan. 28.—The export balance of the United States petroleum industry's foreign trade fell to an 18-year low of approximately 53,400,000 bbl. in 1940. The excess of domestic-oil exports over imports declined almost 75 per cent in the year. Contraction of the trade balance was disproportionate to the decrease in exports because this unfavorable development was accompanied by an increase of nearly 35 per cent in foreign-oil receipts. Imports for the year are estimated at 79,400,000 bbl., the highest total reported since 1931, which was the last full year preceding enactment of the excise tax.

Dislocation of the world's oil trade which caused the United States to suffer losses in its foreign-trade balance was largely chargeable to the European war. European and Mediterranean markets were largely closed to this country by spread of the European war. Likewise, the blockade of European markets drove Latin-American oil into the United States. The Venezuelan trade agreement was another contributing factor to the increment of oil shipments to this country from Latin-American sources. Petroleum exports in 1940 are estimated at 132,800,000 bbl. on the basis of Bureau of Mines figures for the first 11 months.

The ratio of crude oil to refined-product exports since the previous low did not change materially. The change was pronounced in the crude-refined oil ratio in imports since the previous peak. In 1931 crude-oil imports exceeded refined-product imports by approximately 25 per cent, whereas in 1940 they were virtually on a par, showing that a greater proportion of our imports are now refined products. The alteration in our export-import status is shown in the accompanying chart.

Prewar Big Four

Before the war the four largest United States oil customers were Canada, Japan, the United Kingdom and France. Others were Germany, Italy and Spain. France, Germany and Italy were lost entirely, while curtailed domestic consumption has reduced our exports to Canada and the United Kingdom. Japan alone of the major importers of our oil products has substantially increased imports.

Germany was the first major market lost with the beginning of the war. Prior to that, Germany was our best customer for distillate fuels and among the best for motor fuel and lubricating oils. Germany's invasion of the Low Countries and the entrance of France and Italy into the war blocked other markets. France had been a major importer of United States crude oil and motor fuel. Italy also ranked high among the importers of our crude oil and was our third most important customer for residuals. Belgium was an important factor in our gasoline exports as well as light fuel and Norway in motor fuel. Sweden, encompassed by the blockade, was an important gasoline customer.

Effect of the war on the United States' export market is shown in the accompanying table. European purchases of United States petroleum in the first 11 months of 1940 totaled 31,717,069 bbl., a reduction of 41,180,324 bbl., or 56.4 per cent from the similar period of 1939. The loss of more than 8,280,000 bbl. in shipments to Latin America was material, but loses significance in comparison with the reduction in European trade. The combined exports of crude and refined production in the first 11 months of 1940 were 122,649,358 bbl., a net reduction of 54,468,123 bbl. from the preceding year.

The total decline of 17,891,246 bbl. in our exports of crude, a drop of 26 per cent, was concentrated in Europe. The European reduction of 11,246,385 bbl. in crude purchases from this country accounted for 62.8 per cent of the total reduction. Collapse of the European market was even more devastating with regard to refined products, exports of which declined 33 per cent from 109,699,350 bbl. to 73,122,473 bbl. in the first 11 months of this year. Purchases by European countries fell 29,932,939 bbl., which was 81.8 per cent of the total export decline from this country.

The most important change in imports so far as

Destination of United States

(Figures in barrels for 11

Geographical divisions—	Crude oil		Motor fuel		Aviation gasoline	
	1940	1939	1940	1939	1940	1939
North America:						
Canada	27,676,034	26,823,916	2,292,313	2,712,135	55,424	76,286
Per cent of total	55.8	39.7	9.9	6.5	1.5	1.9
Latin America:						
Argentina	684,103	2,124,925				
Brazil			752,563	1,108,028		
Chile			56,314	232,776		
Cuba	747,543	1,066,771	524,187	470,880		
Mexico	341,268	221,507	423,550	258,948		
Netherlands West Indies			776,751	4,847,901	502,729	678,948
Panama			366,928	213,871		
Others						
Total Latin America	1,772,914	3,413,203	2,900,293	7,132,404	502,729	678,948
Per cent of total	3.5	5.0	12.6	17.2	13.9	17.5
Europe:						
Belgium	26	279,389	109,577	1,170,170		
Canary Islands						
Denmark				644,880		38,541
Eire			117,935	195,482		
Finland			171,588	196,945	15,406	46,562
France	5,586,558	12,548,026	856,452	2,585,052	513,513	587,165
Germany		415,900		761,034		23,935
Italy	1,420,253	4,560,900	88,761	315,009	11	213,927
Netherlands		276,018	327,218	1,575,902	18	67,085
Norway			108,014	440,769		
Portugal	530,688	140,296	98,513	415,555		
Spain			1,457,341	1,908,837		
Sweden	45,562	639,349	359,409	3,127,735	32,470	59,064
Switzerland			2,850	328,469		
Turkey				306,424		27,790
United Kingdom	533,126	502,720	3,915,326	8,458,864	1,250,557	491,479
U.S.S.R.			887,531	883,532		
Total Europe	8,116,213	19,362,598	8,500,515	23,314,659	1,811,975	1,555,548
Per cent of total	16.3	28.7	36.9	56.2	50.2	40.0
Oceania:						
Australia			961,402	674,785		
Japan	10,850,538	14,834,322	2,549,326	1,223,754	486,513	519,720
Netherlands East Indies					5	127,629
New Zealand			12,275	387,829	513	79,871
Philippines			918,388	985,230	61,401	53,888
Total Oceania	10,850,538	14,834,322	4,441,391	3,271,598	548,432	781,108
Per cent of total	21.9	22.0	19.3	7.8	15.2	20.1
Asia:						
British India						
China	765,011	1,098,144	1,077,196	1,031,380	35,826	105,132
Thailand						
Total Asia	765,011	1,098,144	1,077,196	1,031,380	35,826	105,132
Per cent of total	1.5	1.6	4.6	2.4	0.9	2.7
Africa:						
Algeria						45,229
Egypt						
Morocco						65,958
Mozambique						
Union of South Africa			117,435	264,000		
Total Africa			117,435	264,000		111,187
Per cent of total			0.5	0.6		2.8
Miscellaneous:						
Noncontiguous United States			2,432,377	2,212,926	307,064	251,025
Others	346,175	1,885,948	1,237,136	1,563,657	342,270	319,987
Total Miscellaneous	346,175	1,885,948	3,669,513	3,776,583	649,334	571,012
Per cent of total	0.6	2.7	15.9	9.9	18.0	14.7
Grand total exports	49,526,885	67,418,131	22,998,656	41,502,759	3,603,720	3,879,221

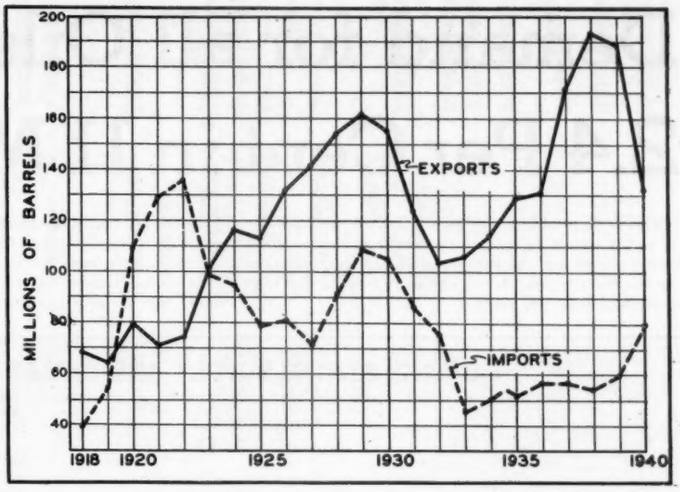
a particular product is concerned was that in light fuel oils. Total imports of distillate fuels in 1939 were 753,593 bbl., of which 185,859 bbl. were for immediate consumption and 567,734 bbl. in bond. In contrast, in the first 11 months of 1940 imports for immediate consumption were up to 2,962,221 bbl. and those for manufacture and export, 1,059,776 bbl. A breakdown of our imports of distillate fuel oil in the first 11 months of 1940 follows:

Source—	For immediate consumption (bbl.)	For manufacture and export (bbl.)
Netherlands West Indies	511,316	88,560
Mexico	2,175,572	0
Venezuela	275,333	971,216
All countries	2,962,221	1,059,776

Residual Fuel-Oil Gains

Imports of residual fuel showed the most gain of other products, rising from 16,145,607 bbl. in the 11 months of 1939 to 26,514,596 bbl. in 1940. Imports from Venezuela showed the greatest gain, totaling 8,970,199 bbl., against none in 1939. Imports of unfinished oils were down from the year before as the Netherlands West Indies curtailed exports, reducing its total 2,200,000 bbl. The Netherlands West Indies provides our only imports of consequence of unfinished oils. As Venezuela was the principal beneficiary of the reduced excise taxes on residual fuel oil, Mexico was helped the most by the reduction as it applied to crude oil. Imports of crude oil rose 7,000,000 bbl. in the first 11 months of 1940, and of this increase Mexico accounted for 6,300,000 bbl. Venezuela was up 1,250,000 bbl., while Colombia dropped 800,000 bbl. and Trinidad and Tobago dropped 61,500 bbl.

Chart shows the sharp attraction of oil-export and import curves in 1940



Exports of motor fuel, exclusive of aviation or high-grade gasoline, declined 44.8 per cent from 41,502,759 bbl. in the first 11 months of 1939 to 22,998,656 bbl. in the first 11 months of 1940. These figures include natural gasoline, naphtha, and benzol. One of the severe blows to the foreign gasoline market was the reduction in demand from the Netherlands West Indies which had taken large quantities of natural gasoline as well as other light products. Netherlands West Indies imports of United States motor fuel dropped 4,000,000 bbl., a decrease that was proportionately much greater than the United Kingdom's reduction of 4,500,000 bbl French requirements dropped 1,700,000 bbl. The only increase of importance was that registered by Japan, which lifted its motor-fuel imports from the United States more than 100 per cent. Canada, our principal customer for gasoline as well as crude oil, dropped 400,000 bbl., approximately 15 per cent.

TABLE SHOWING IMPORTS

	11 months— 1940	1939
Residual fuel oil:		
Canada	0	2,203
Mexico	618,570	81,757
Netherlands West Indies	16,784,890	15,184,892
Trinidad, Tobago	58,566	874,755
Venezuela	8,979,199	0
Others	73,371	0
All countries	26,514,596	16,143.607
Unfinished oils:		
Canada	3,296	2,495
Mexico	359	667
Netherlands West Indies	5,712,519	7,948,253
Others	1,309	3,095
All countries	5,717,483	7,954,510
Crude oil:		
Colombia	365,313	1,166,439
Mexico	11,147,724	4,819,895
Trinidad, Tobago	0	61,496
Venezuela	26,653,021	25,406,206
Others	252	1,537
All countries	38,266,310	31,455,573

Petroleum Exports by Products

months of 1939 and 1940)

Kerosene 1940	Kerosene 1939	Distillate fuel 1940	Distillate fuel 1939	Residual fuel 1940	Residual fuel 1939	Lubricating oil 1940	Lubricating oil 1939	Total Refined oils 1940	Total Refined oils 1939
172,731	172,703	517,561	564,289	1,578,453	568,832	496,338	491,784	5,112,820	4,586,029
5.3	2.2	2.8	1.9	10.4	3.4	5.0	4.6	6.9	4.1
202,776	379,901	149,091	164,785			280,827	270,025	1,385,257	1,922,739
		444,214	175,867	1,545,468	1,653,163	74,280	74,254	2,120,276	2,136,060
		59	67,589	512,327	322,362			1,036,573	860,831
		124,922	96,564	892,095	351,323	92,561	95,675	1,533,128	802,510
26,081	497,064	1,872,224	4,686,007					3,177,785	10,709,920
		1,143,686	981,324	1,162,155	790,265			2,672,769	1,985,460
4,531	101,494			176,786	229,622			181,317	331,116
233,388	978,459	3,734,196	6,172,136	4,288,831	3,346,735	447,668	439,954	12,107,105	18,748,636
7.1	12.9	20.5	20.7	28.3	20.5	4.5	4.1	16.6	17.1
		104,267	977,961			174,711	874,469	388,555	3,022,600
				61,145	464,007			61,145	464,007
572	399,843	94,397	508,754	50,763	273,003	9,830	357,696	155,562	2,222,717
35,363	52,002							153,298	247,484
36,991	32,465	3,806	53,130					227,791	329,102
			132,854			330,826	387,885	1,700,791	3,692,956
			3,294,878		193,569		1,125,077		5,398,493
		172,622	150,831	129,793	1,345,465	317,488	443,885	708,675	2,469,117
181,979	954,544	287,378	2,573,400		453,730	89,947	295,202	886,540	5,919,863
53,504	188,220	305,623	527,363			57,998	67,953	525,139	1,224,365
618	225,411	152,294	168,744					251,425	809,710
		1,058,239	621,611	1,360,052	668,001	277,295	321,631	4,152,927	3,526,080
16,881	448,240	271,642	1,004,107		392,456	111,052	247,269	791,454	5,278,871
			112,785					2,850	441,254
6	166,401							6	500,615
447,313	1,362,868	3,367,268	4,060,646	340,331	279,293	3,387,372	2,456,939	12,708,167	17,110,089
								887,531	883,532
773,227	3,829,994	5,817,536	14,187,064	1,942,084	4,069,524	4,756,519	6,578,006	23,601,856	53,534,795
23.7	50.4	31.9	47.6	12.8	24.9	48.0	61.9	32.3	48.8
154,130	100,681					599,636	537,626	1,715,198	1,313,092
43,463	51,061	4,904,360	5,426,425	2,040,332	3,655,457	659,444	453,335	10,683,438	11,329,752
			78,275	100,828	89,435	116,100	81,859	216,933	377,198
		48,605	49,628			150,614	88,679	212,007	606,007
414,370	442,293	475,625	505,654	655,522	766,956	118,417	119,152	2,643,723	2,873.173
611,963	594,035	5,428,590	6,059,982	2,976,682	4,511,848	1,644,241	1,280,651	15,471,299	16,499,222
18.7	7.8	29.7	20.3	18.4	27.7	16.6	12.0	21.1	15.1
3,325	81,417					560,155	350,335	563,480	431,752
451,127	533,612	432,666	594,859	61,739	393,442	235,678	177,526	2,294,232	2,835,951
235,838	59,242	82,614	134,363					318,452	193,605
690,290	674,271	515,280	729,222	61,739	393,442	795,833	527,861	3,176,164	3,461,308
21.1	8.8	2.8	2.4	0.4	2.4	8.1	4.9	4.3	3.1
									45.229
59,551	441,808					172,347	114,650	231,898	556,458
									65,958
						142,672	80,562	142,672	80,562
					358,044	308,140	148,913	425,575	770,957
59,551	441,808				358,044	623,159	344,125	800,145	1,519,164
1.8	6.2				2.1	6.2	3.2	1.0	1.3
255,729	254,226	1,516,328	1,120,041	4,083,163	2,310,691	120,415	107,355	8,715,076	6,256.264
466,945	644,751	692,590	947,654	388,630	747,284	1,010,437	870,599	4,138,008	5,093,932
722,674	898,977	2,208,918	2,067,695	4,471,793	3,057,975	1,130,852	977,954	12,853,084	11,350,196
22.1	11.8	12.1	6.9	29.5	18.7	11.4	9.1	17.5	10.3
3,263,824	7,590,247	18,222,081	29,780,388	15,139,582	16,306,400	9,894,610	10,640,335	73,122,473	109,699,350

Exports of gas oil and distillate fuel for 11 months of 1940 totaled 18,222,081 bbl., 39 per cent under the corresponding 1939 figure. The loss of our German market was especially severe, for in the 1939 period Germany had taken 3,294,878 bbl. and none in 1940. Another large reduction was that of the Netherlands West Indies, which took 2,800,000 bbl. less in 1940.

Residual fuel exports declined less than 8 per cent, but almost all of the destinations showed marked variations in the 2 years. The most important changes were the reductions in shipments to Japan, 1,600,000 bbl., and to Italy, 1,120,000 bbl., which were offset by the increase of 1,700,000 bbl. to noncontiguous United States territories and an increase of 1,000,000 bbl. in exports to Canada. Spain also showed a marked increase in its imports of United States residual oil as well as in imports of distillate fuels. Spain's combined fuel-oil imports from the United States in 1940 were almost 100 per cent greater than in 1939.

Most widely distributed of all products in the foreign market is lubricating oil and possibly for this reason it suffered least. Exports of lubricating oil in the first 11 months of 1940 were 9,894,610 bbl., a decline of but 7 per cent. The most serious blow to the foreign lubricating-oil market was the loss of Germany, which ranked second to the United Kingdom as a customer. Germany took 1,125,077 bbl. in 1939 but none in 1940. This loss was largely offset by an increase of 900,000 bbl. in the United Kingdom's imports. European countries took 1,821,487 bbl. less of lubricating oils in the first 11 months of 1940 than in the same 1939 period despite the United Kingdom's increase.

Demand for all Oils Rises 2.4 Per Cent in 11 Months

TOTAL demand for all oils was 2.4 per cent greater at the end of 11 months in 1940 than for the same period a year ago, the Bureau of Mines report shows in the summary below. At the end of 10 months, the 1940 increase was 2.3 per cent.

Increased domestic demand for all products is exclusively responsible for the record. Increases in domestic requirements for 11 months range from 3.9 per cent on lubricating oils to 18.8 per cent for distillate fuels. Export demand is off 5.9 to 57.1 per cent.

UNITED STATES SUPPLY AND DEMAND

Eleven months, 1940 and 1939. (All figures in thousands of barrels)

Crude Oil

11 months—	Total supply	Total demand	Excess Demand	Excess Pct.	Domestic production	Imports	Indicated domestic demand‡	Exports	Stocks refinable crude Nov. 30‖
1940	1,279,332	1,256,152	*23,180	*1.8	1,241,327	38,005	1,206,626	49,526	263,163
Daily average	3,819	3,740	.....	...	3,705	113	3,602	148	.....
1939	1,180,609	1,222,549	41,940	3.4	1,149,842	30,767	1,155,129	67,420	235,291
Daily average	3,535	3,660	.....	...	3,443	92	3,458	202	.....
Increase, 1940	98,723	33,603	.....	...	91,485	7,238	51,497	†17,894	27,872
	8.4%	2.7%	.....	...	8.0%	23.5%	4.5%	†26.5%	11.8%

Refinery Products—Motor Fuel

11 months—	Total supply	Total demand	Excess Demand	Excess Pct.	Domestic production	Imports	Domestic demand	Exports	Stocks Nov. 30§
1940	563,944	566,135	2,191	0.4	563,851	93	543,011	23,124	79,531
Daily average	1,683	1,690	.....	...	1,683	.....	1,621	69	.....
1939	558,623	553,204	*5,419	*1.0	558,579	44	511,702	41,502	76,198
Daily average	1,672	1,656	.....	..	1,672	.....	1,532	124	.....
Increase, 1940	5,321	12,931	.....	...	5,272	49	31,309	†18,378	3,333
	0.9%	2.3%	.....	..	0.4%	111.4%	6.1%	†44.3%	4.4%

Kerosene

1940	67,123	64,226	*2,897	*4.5	66,988	135	60,968	3,258	10,473
1939	62,699	61,479	*1,220	*2.0	62,699	.....	53,890	7,589	9,019
Increase, 1940	4,424	2,747	.....	...	4,289	.....	7,078	†4,331	1,454
	7.1%	4.5%	.....	..	6.8%	....	13.1%	†57.1%	16.1%

Gas Oil and Residual Fuel Oil¶

1940	483,358	479,829	*3,529	*0.7	454,989	28,369	446,446	33,383	139,016
1939	441,323	456,218	14,895	3.3	426,313	15,010	410,031	46,187	134,584
Increase, 1940	42,035	23,611	.....	...	28,676	13,359	36,415	†12,804	4,432
	9.5%	5.2%	.....	..	6.7%	89.0%	8.9%	†27.7%	3.3%

Gas Oil and Distillate Fuels

1940	169,839	162,675	*7,164	*4.4	166,696	3,143	144,456	18,219	46,624
1939	147,313	151,577	4,246	2.8	147,313	.....	121,555	30,022	37,888
Increase, 1940	22,526	11,098	.....	...	19,383	.....	22,901	†11,803	8,736
	15.3%	7.3%	.....	...	13.2%	.....	18.8%	†39.3%	23.1%

Residual Fuel Oils

1940	313,519	317,154	3,635	1.1	288,293	25,226	301,990	15,164	92,392
1939	294,010	304,641	10,631	3.5	279,000	15,010	288,476	16,165	96,696
Increase, 1940	19,509	12,513	.....	...	9,293	10,216	13,514	†1,001	†4,304
	6.6%	4.1%	.....	..	3.3%	68.1%	4.7%	†6.2%	†4.5%

Lubricating Oils

1940	33,900	32,688	*1,212	*3.7	33,900	.....	22,743	9,945	8,365
1939	31,558	32,459	901	2.8	31,558	.....	21,888	10,571	6,799
Increase, 1940	2,342	229	.....	...	2,342	.....	855	†626	1,566
	7.4%	0.7%	.....	...	7.4%	.....	3.9%	†5.9%	23.0%

Petroleum Wax (Thousands of pounds)

1940	550,966	506,402	*44,564	*8.8	469,560	81,406	325,115	181,287	120,212
1939	451,580	499,551	47,971	9.6	416,080	35,500	281,490	218,061	81,369
Increase, 1940	99,386	6,851	.....	...	53,480	45,906	43,625	†36,774	38,843
	22.0%	1.4%	.....	...	12.9%	129.3%	15.5%	†16.9%	47.7%

*Excess supply. †Decrease. ‡Crude only. §Includes finished and unfinished refinery gasoline and natural gasoline. ¶Gas oil and fuel oil equals gas oil and distillate fuels plus residual. Note: Total supply equals domestic production plus imports. Total demand equals domestic demand plus exports. Data on demand for refined products based on refinery shipments. ‖Does not include 12,257,000 bbl. of heavy oils in California. Comparable figure for November 30, 1939, 13,664,000.

Crude Oil Run to Stills and Total All Oils

11 months—	Total imports§	Total exports§	Total crude to stills	Per cent yield gasoline‡	Natural gasoline production	Total supply all oils*	Total demand all oils*	Stocks all oils Nov. 30*
1940	74,287	123,637	1,184,580	43.1	50,299	1,368,776	1,326,722	566,824
Daily average	222	369	3,536	..	150	4,086	3,960	.....
1939	55,149	175,746	1,132,005	44.9	47,073	1,254,281	1,296,096	525,888
Daily average	165	526	3,389	...	141	3,755	3,881	.....
Increase, 1940	19,138	†52,109	52,575	...	3,226	114,495	30,626	40,936
	34.7%	†29.7%	4.6%	...	6.9%	9.1%	2.4%	7.8%

*Total all oils includes crude and refined products, natural gasoline, and benzol. Stocks November 30, 1940, represented 143 days' supply, which compares to 136 days on the same date in 1939. †Decrease. ‡Does not include natural gasoline blended at refineries. §Includes crude oil and refinery products. In case of imports includes receipts in bond and for domestic use. All data based on Bureau of Mines reports.

Completions in 1940 Show Good Record of Success

(Continued from Page 53)

sissippi and Alabama, and their efforts may be rewarded at any time.

From the Mississippi to the Rio Grande, the year was one of successful deep drilling and less successful wildcatting. In Louisiana, salt-dome operators had sufficient success to encourage the belief that no dome should be abandoned until every possibility of flank production has been exhausted. Probably the outstanding example is Anse La Butte which was an indifferent supercap field until deep production was established on the flank. The Wilcox trend saw another field of major proportions, Neale, and the many scattered discoveries and near discoveries insure continued activity in 1941. In 1940, there was a net increase of 459 producing wells in coastal Louisiana with Ville Platte, Golden Meadow, Charenton and Eola providing the greatest increases.

The Texas Gulf Coast had a less spectacular year. Jackson County sprang into the front rank of producing counties with development of West Ranch, with 172 additional wells, followed by Lolita which had 57 wells drilled during the year. In other fields development forged steadily ahead, but the play that appealed most to the imagination was the submarine drilling which opened up two fields in Galveston Bay and is now working on new prospects. The Wilcox trend was not forgotten as two fields were found, Sheridan in Colorado County, and Shepherd in San Jacinto.

Southwest Texas also had its successes in the Frio and Wilcox trends. In Baffin Bay and East Flour Bluff, it has its offshore fields as well. The Wilcox discovery at Thomaston in De Witt County ties this play to that in the upper Gulf Coast area and the Washburn discovery in La Salle County extends it far to the west. The Wilcox trend is now good prospective territory from the Mississippi to the Rio Grande and should see much activity in the near future.

The lower Rio Grande Valley should also come in for a play as the Willamar discovery in Willacy County opened the area up for production and made the whole region between this pool and the Corpus Christi area good prospecting ground. Producing wells in Southwest Texas increased by 1,014 with the greatest number of additions in Adami, Seven Sisters, Colorado, Ben Bolt and Premont.

Western Fields

There were few discoveries of consequence in the Rocky Mountain area, most of the drilling being confined to inside locations in Cut Bank, Kevin-Sunburst and Lance Creek. The most significant single feature was the drilling of 41 gas wells in Montana, an increase of 22 over the preceding year.

Rounding out the picture of successful drilling activity, California was most successful in biding its time. No important discoveries were made on the coast and uncertain market conditions made it better so. However, discoveries of relatively shallow oil in the Newhall-Castaic region of Los Angeles County assured the small operator that deep drilling had not altogether removed him from the scene and this region will undoubtedly see much activity in the near future.

Throughout the country, results obtained in 1940 encourage the belief that if drilling in 1941 does not equal that of the past year it will be the fault of the market and of other extraneous factors, notably Washington. The opportunities are present and the prospects await the drill.

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Greater Use of Compact and State Oil Laws Suggested

FULL use of the interstate oil compact and state regulatory laws offers one possible escape from threatened federal control, in the opinion of several respondents. Three replies had the following to say regarding this phase of 1941 objectives:

WALTER S. HALLANAN

President, Plymouth Oil Co.

AS America works feverishly to build an impregnable defense against possible aggression, it is a fortunate circumstance that there are no bottlenecks in the one industry upon which all others depend. Oil is indeed the nation's vital lifeline, both in time of peace and war.

It is no mere chance that in an hour of grave emergency the nation finds its most vital industry prepared to meet every demand of the defense program. It is due to wise foresight and careful planning and the program of conservation that the industry itself, in cooperation with public officials of leading oil-producing states, put into effect several years ago.

ALL these instrument trucks are attached to Barret magnetic crews that will work all of 1941
FOR ONE MAJOR OIL COMPANY
Such recognition can only be inspired by proven successes in the past . . . . .
Successes made possible by methods developed in our 13 years of constant research.

WILLIAM M. BARRET, INC.
Consulting Geophysicists
GIDDENS - LANE BLDG., SHREVEPORT, LA.

W. A. DELANEY, JR.

Independent

IT appears to me that the president will be able to put sufficient pressure on Congress to pass the new draft of the Cole bill early in the present session. Whether this is a good thing or a bad thing for the industry is a matter that will be determined only by the passage of time and the character of administration to which the industry is subjected.

One thing that must be done before any method of controlled production can function to the benefit of the industry is to ascertain what are our present actual reserves. For the past 9 years we have built paper potentials that have created reserves of astronomical figures. No industry can continue to engage in exploratory effort which is hazardous in the extreme and continue to sell its product for less than the cost of discovery and production.

WINSTON P. HENRY

President, Putnam Oil Co.

IT is very important to strengthen the prestige of the interstate oil compact and to develop it to its greatest possibilities. It is possible for the Compact Commission to develop such prestige that its suggestions, without any powers of enforcement, will be accepted by the entire industry.

It is necessary for the oil industry to be alert to the threat of narrow well spacing that now appears to exist in the Hawkins field in Wood County, Texas.

Since the conclusion of the Venezuelan trade pact in January 1940 the imports into this country are constantly increasing. This is a grave danger to the domestic industry, inasmuch as we can expect a constant increase of higher-gravity oils in the future.

●

Careful Study Urged in Expanding Refining Capacity

By C. L. HENDERSON

Vickers Petroleum Co. and President, Western Petroleum Refiners Association

THE petroleum industry on January 1, 1941, had about 3 per cent more gasoline stocks than on January 1, 1940, which probably was due to the stocks of aviation gasoline that were being built up for the defense program. Based on the statistical trend of gasoline stocks, the amounts January 1, 1941, probably were about 5,000,000 bbl. more than required for normal conditions.

With the loss of the export business it is estimated that the demand for gasoline in 1941 will be about 6 per cent above 1940; if the defense program gets into full swing, the demand for all petroleum products will far exceed that of 1940.

No doubt there will be much improvement in existing plants, and some increase in plant capacity, but the technologists no doubt will concentrate their efforts on developing new catalysts, increasing yields and synthetic products from petroleum.

Expansion programs should be studied very carefully, so that when the time comes to turn to full peacetime operations, there will be very little surplus capacity and equipment.

●

Militant Opposition to Federal Control Is Urgent Need

(Continued from Page 51)

who control refining, transporting and marketing, as well as their own production.

Tanker rates, which have been especially disastrous in 1940 for Gulf Coast refiners, should be kept properly in line.

CHANGES IN CRUDE-OIL PRICES DURING 1940 . . .

WEST TEXAS (EXCEPT PECOS COUNTY) AND LEA COUNTY, NEW MEXICO

Gravity—	Jan. 1
Below 20	$0.53
20-20.9	.55
21-21.9	.57
22-22.9	.59
23-23.9	.61
24-24.9	.63
25-25.9	.65
26-26.9	.67
27-27.9	.69
28-28.9	.71
29-29.9	.73
30-30.9	.75
31-31.9	.77
32-32.9	.79
33-33.9	.81
34-34.9	.83
35-35.9	.85
36-36.9	.87
37-37.9	.89
38-38.9	.91
39-39.9	.93
40 and over	.95

Humble Oil & Refining Co. and Stanolind Oil Purchasing Co. Texas Co. schedule starts below 26°, 65 cents, and ends at 36° and over at 87 cents. Gulf Refining Co. starts at below 26° at 65 cents and ends at 40° and over at 95 cents. Magnolia Petroleum Co. schedule starts below 25°, 63 cents, and ends at 40° and above at 95 cents. Sinclair Prairie Oil Marketing Co. schedule same as that of Magnolia, but revised on Mar. 24, 1939, to stop at 36° and over at 87 cents. Stanolind Oil & Gas Co. (Winkler County) starts at below 26°, 65 cents, with a 2-cent spread, and a top of 95 cents for 40° and above. Effective Sept. 1, 1939, Shell Oil Co., Inc., posted Yoakum County crude, starting at below 20°, 53 cents, with 2 cents added for each degree up to 36° and over at 87 cents. Effective March 31, 1940, Atlantic Refining Co. added Gaines County to its price schedule. Magnolia effective Dec. 6, 1940, added Cochran, Hockley, Yoakum and Gaines counties to its schedule.

GRAY COUNTY, TEXAS

Gravity—	Jan. 1
28-28.9	$0.72
29-29.9	.74
30-30.9	.76
31-31.9	.78
32-32.9	.80
33-33.9	.82
34-34.9	.84
Below 35	
35-35.9	.86
36-36.9	.88
37-37.9	90
38-38.9	.92
39-39.9	.94
40 and over	.96

Humble Oil & Refining Co., Sinclair Prairie Oil Marketing Co. and Magnolia Petroleum Co. Texas Co. quoted "Panhandle sweet crude," beginning with 34 34.9° at 84 cents, with 2-cent spread to 40° and over at 96 cents, and "Panhandle sour crude" 79 cents for 34-34.9°, with a top of 91 cents for 40° and over. Gulf Refining Co. quotes "Panhandle sweet crude" at below 29°, 72 cents, with a 2-cent spread, and top price of 96 cents for 40° and above, and "Panhandle sour crude" below 29°, 67 cents, with a top of 91 cents for 40° and above. Phillips Petroleum Co. schedule for sweet crude in Gray, Carson, and Hutchinson counties starts at below 29°, 72 cents, with a spread of 2 cents up to 96 cents for 40° and over.

ARTESIA, JACKSON, AND MALJAMAR, N. M.

Gravity—	Jan. 1
28-28.9	$0.61
29-29.9	.63
Below 30	
30-30.9	.65
31-31.9	.67
32-32.9	.69
33-33.9	.71
34-34.9	.73
Below 35	
35-35.9	.75
36-36.9	.77
37-37.9	.79
38-38.9	.81
39-39.9	.83
40 and over	.85

Continental Oil Co.

WEST TEXAS

	Jan. 1
Fisher County, Tex.	(See note below)
Pecos County, Tex.*	$.78
Pecos Shallow†	.65

*Posted by Shell Oil Co., Inc., Gulf Pipe Line Co. and Humble Oil & Refining Co. †Posted by Shell Oil Co., Inc.

Fisher County posted by Shell Oil Co., Inc., below 25°, 68 cent, 25°, 70 cents, with a 2-cent spread to 40° and over at $1.

CARSON AND HUTCHINSON COUNTIES, TEXAS

Gravity—	Jan. 1
28-28.9	$0.67
29-29.9	.69
30-30.9	.71
31-31.9	.73
32-32.9	.75
33-33.9	.77
34-34.9	79
Below 35	
35-35.9	.81
36-36.9	.83
37-37.9	.85
38-38.9	.87
39-39.9	.89
40 and over	.91

Humble, Magnolia Petroleum and Sinclair Prairie Oil Marketing Co. Texas Co. quoted "Panhandle sweet crude" at 34-34.9°, 84 cents, with a top of 96 cents for 40°, and "Panhandle sour crude" at 34-34.9°, 79 cents, with a top of 91 cents for 40° and over. Gulf Refining Co. quoted "Panhandle sweet crude" at below 29°, 72 cents, with a top of 96 cents for 40° and over and "Panhandle sour crude" at below 29°, 67 cents, with a top of 91 cents for 40° and above. Phillips Petroleum Co. schedule for sour crude in Carson, Moore, and Hutchinson counties, started at below 29° at 67 cents with a spread of 2 cents up to 91 cents for 40° and over.

MIDDLE WESTERN STATES

	Jan. 1	Apr. 27	Aug. 21	Aug. 24	Nov. 1	Dec. 23
Illinois old fields§	$.95	....	$1.00	....	....	....
Illinois basin¶§	1.05	....	1.15	....	....	....
Storms field, Ill.§	....	....	....	....	$1.05	....
Princeton, Ind.§	.95	....	1.00	....	....	....
Western Kentucky†	.90	....	1.10	....	....	....
Birk City, Ky.¶	.90	....	1.05	....	....	....
Corydon, Ky.¶	.90	....	1.05	....	....	....
Greendale, Porter, Crystal and Wise, Mich.*‡	1.02	....	....	$1.12	....	....
Buckeye, Bentley, Edenville, Beaverton, Mich.*	1.00	....	....	1.10	....	....
Clare - Freeman - Redding, Mich.‡	.97	....	....	1.07	....	....
Arenac, Mich.*	.82	....	....	.92	....	....
West Branch, Mich.*	.85	....	....	.92	....	....
Moniter (sweet crude), Bay County, Michigan*	....	....	....	....	....	$1.10
Allegan-Kent, Mich.¶	1.03	$1.08	....	1.18	....	....
Ottawa, Mich.¶	.85	1.08	....	1.18	....	....
Bloomingdale and Columbia, Mich.¶	1.03	1.08	....	....	1.18	....
Muskegon, Mich.	1.00	....	....	....	....	....
Sherman and Freeman, Mich.‡	.97	....	....	1.07	....	....
Adams, Mich.‡	....	....	....	.95	....	....
Van Buren, Mich.‖	1.03	....	....	....	1.18	....
Eastern Kentucky:						
Big Sandy River†	1.02	....	1.12	....	....	....
Kentucky River†	1.10	....	1.20	....	....	....

*Simrall Corp. †Ashland Refining Co. ‡Pure Transportation Co. ¶Sohio Oil Co §Ohio Oil Co. ‖Naph-Sol Pipe Line Co. Allegan, Kent, and Ottawa counties also posted by Imperial Pipe Line Co. and Commonwealth Pipe Line Co.

PENNSYLVANIA GRADE CRUDE PRICES

	Jan. 1	May 22	June 18	July 12	Aug. 28	Nov. 12	Dec. 17
Posted by Tide Water Associated Oil Co. and New York Transit Co.:							
Bradford, Pa.	$2.75	$2.50	$2.25	$2.00	$1.85	$2.00	$2.15
Allegany, N. Y.	2.75	2.50	2.25	2.00	1.85	2.00	2.15
Posted by South Penn Oil Co.:							
Pennsylvania Grade oil in National Transit lines (Bradford field)	2.75	2.50	2.25	2.00	1.85	2.00	2.15
Pennsylvania Grade oil in Southwest Pennsylvania lines	2.40	2.15	1.90	1.65	1.50	1.65	1.80
Pennsylvania Grade oil in Eureka Pipe Line lines	2.34	2.09	1.84	1.59	1.44	1.59	1.74
Corning Grade oil in Buckeye Pipe Line Co. lines	1.12	1.12	1.12	1.12	.97	1.12	1.12
Posted by Pennzoil Co.:							
Pennsylvania Grade oil in National Transit lines:							
Group A — Includes Cochran, Franklin, Hamilton, and Doolittle districts.	2.68	2.43	2.18	1.93	1.78	1.93	2.08
Group B — Includes Titusville district.	2.67	2.42	2.17	1.92	1.77	1.92	2.07
Group C — Includes Turkey and Tidioute districts.	2.66	2.41	2.16	1.91	1.76	1.91	2.06
Group D — Includes Bear Creek and Porkey districts.	2.65	2.40	2.15	1.90	1.75	1.90	2.05
Group E — Includes Edeneau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Jameson, Kenerdell, Emlenton, Tiona, Lacy, and Kinzau districts. Price depends on length of pipe line to plant at Oil City.	2.63	2.38	2.13	1.88	1.73	1.88	2.03
Posted by Pure Oil Co.:							
Cabin Creek, W. Va.	2.34	2.09	1.84	1.59	1.44	1.59	1.74
Bradford Hollow, W. Va.	2.34	2.09	1.84	1.59	1.44	1.59	1.74
Kelly Creek, W. Va.	2.34	2.09	1.84	1.59	1.44	1.59	1.74
Posted by Quaker State Oil Refining Corp.:							
Pennsylvania Grade oil in Buckeye Pipe Line Co. lines	2.30	2.05	1.80	1.55	1.40	1.55	1.70
Pennsylvania Grade oil in Eureka Pipe Line Co. lines	2.34	2.09	1.84	1.59	1.44	1.59	1.74

OKLAHOMA AND KANSAS

Gravity—	Jan. 1	Jan. 1	Jan. 1
20-20.9	0.70	....	$.60
21-21.9	.72	....	.63
22-22.9	.74	....	.66
23-23.9	.76	....	.69
24-24.9	.78	....	.72
25-25.9	.80	$.58	.75
26-26.9	.82	.63	.78
27-27.9	.84	.68	.81
28-28.9	.86	.73	.84
29-29.9	.88	.78	.87
30-30.9	.90	.82	.90
31-31.9	.92	.86	.92
32-32.9	.94	.90	.94
33-33.9	.96	.96	.96
34-34.9	.98	.98	.98
35-35.9	1.00	1.00	1.00
36-36.9	1.02	1.02	1.02
37-37.9	1.04	1.04	1.04
38-38.9	1.06	1.06	1.06
39-39.9	1.08	1.08	1.08
40 and over	1.10	1.10	1.10

Column 1—By Standard Oil Co. of Indiana and Gulf Refining Co. Gulf Oil Corp. starts at below 25°, 78 cents. Texas Co. and Continental Oil Co. schedule starts at 28°-28.9° at 86 cents. Pure Oil Co. same as Standard of Indiana's schedule.

Column 2—By Sinclair Prairie Oil Marketing Co.

Column 3—Magnolia Petroleum Co., Carter Oil Co. and Shell Oil Co., Inc.

ALTUS AND TIPTON, OKLAHOMA

Gravity—	Jan. 1*
Below 25	$.71
25-25.9	.73
26-26.9	.75
27-27.9	.77
28-28.9	.79
29-29.9	.81
30-30.9	.83
31-31.9	.85
32-32.9	.87
33-33.9	.89
34-34.9	.91
35-35.9	.93
36-36.9	.95
37-37.9	.97
38-38.9	.99
39-39.9	1.01
40 and over	1.03

Posted by Gulf Refining Co.

GULF COAST*

Gravity—	Jan. 1
Below 20	$0.86
20-20.9	.88
21-21.9	.90
22-22.9	.92
23-23.9	.94
24-24.9	.96
Below 25	....
25-25.9	.98
26-26.9	1.00
27-27.9	1.02
28-28.9	1.04
Below 29	....
29-29.9	1.06
30-30.9	1.08
31-31.9	1.10
32-32.9	1.12
33-33.9	1.14
34-34.9	1.16
Below 35	....
35-35.9	1.18
36-36.9	1.20
37-37.9	1.22
38-38.9	1.24
39-39.9	1.26
40 and over	1.28

*Includes crudes purchased in Goose Creek, Sugarland, Thompsons, Mykawa, Amelia, Webster, Clear Lake and West Beaumont.

Posted by Humble Oil & Refining Co., Sinclair Prairie Oil Marketing Co. and Gulf Refining Co. in Texas Coast. Texas Co. schedule in Texas and Louisiana Coast stops at $1.16 for 34° and over. Sun Oil Co. posts above schedule in Texas and Louisiana Coast. Gulf Refining Co. schedule in Louisiana Coast stops at $1.16 for 34° and above.

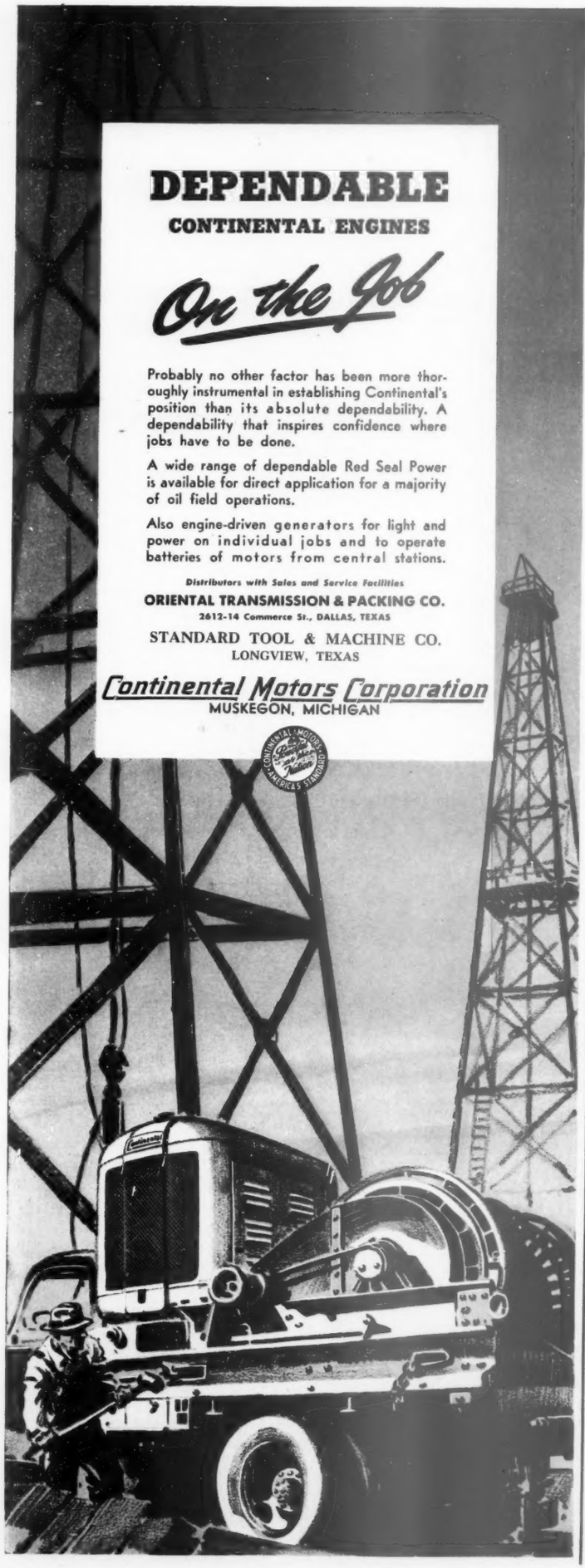
GULF COAST FIELDS

Conroe, Tex. (Oct. 11, 1938)*‡	$1.27
Black Bayou and White Castle, La. (Oct. 11, 1938)‡	See note below
Gibson, La. (Oct. 11, 1938)†	$1.04
Garden Island, La. (Oct. 12, 1938)‡	1.24
Lafitte, La. (Oct. 12, 1938)‡	1.04
Cleveland, Tex. (Oct. 12, 1938)¶	1.14
Hardin, Tex. (Sept. 14, 1939)*¶	1.10
Fig Ridge, Tex. (July 11, 1940)††	1.10
Seabreeze, Willow Slough, and La-Belle, Tex. (Sept. 14, 1938)††	1.10
Schwab-Wilcox, Polk County, Tex.	See note below
Tepetate, La. (Oct. 11, 1938)§	$1.03
Ville Platte, La. (Oct. 11, 1938)§	1.03
Abbeville, La. (Jan. 1, 1939)§	See note below
Bosco, La. (Dec. 3, 1938)‖	$0.93
Fause Point, La. (July 11, 1940)††	1.10
Vinton, Edgerly, Starks, Hackberry, Timbalier Bay, Quarantine Bay, and Grand Bay, La. (Oct. 2, 1939)**	See note below
Segno and Wing (Oct. 2, 1939)**	See note below
Happytown, La. (Jan. 12, 1940)†	$1.00
Livingston (Oct. 11, 1938)†	1.10
Hackberry, East and West,	See note below

*Humble Oil & Refining Co. †Shell Oil Co., Inc. ‡Texas Co. §Continental Oil Co. ‖Pure Oil Co. ¶Magnolia Petroleum Co. **Gulf Refining Co. ††Sun Oil Co.

Hardin prices by Humble and Sun companies.

Black Bayou, etc., starts at below 20°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at 79 cents; 20°-20.9°, 81 cents; 21°-21.9°, 83 cents; then a 3-cent spread to 26°-26.9°, 98 cents; then a 2-cent spread at 40° and over at $1.14.

Abbeville starts at below 36°, 92 cents; 2-cent spread to 40° and over at $1.02.

Segno and Wing take Gulf Refining Co.'s Gulf Coast prices.

Vinton, Edgerly, etc., schedule starts at below 20°, 86 cents, 2-cent spread to 34° and above at $1.16.

Shell Oil Co., Inc., withdrew as a purchaser in the Schwab-Wilcox area, Texas, on Apr. 8, 1940.

Hackberry, East and West, by Stanolind Oil & Gas Co., below 20 gravity 86 cents, 2 cents added for each degree up to 34° and over at $1.16.

RACCOON BEND (Deep Sand), TOMBALL, SATSUMA, TEXAS

Gravity—	Jan. 1
22-22.9	$0.95
23-23.9	.97
24-24.9	.99
25-25.9	1.01
26-26.9	1.03
27-27.9	1.05
28-28.9	1.07
Below 29	...
29-29.9	1.09
30-30.9	1.11
31-31.9	1.13
32-32.9	1.15
33-33.9	1.17
34-34.9	1.19
35-35.9	1.21
36-36.9	1.23
37-37.9	1.25
38-38.9	1.27
39-39.9	1.29
40 and over	1.31

Humble Oil & Refining Co.; Magnolia Petroleum Co. and Continental Oil Co. in Tomball. Stanolind Oil Purchasing Co. in Tomball posts same as Humble except begins at below 29°, $1.07.

LOCKPORT, IOWA, AND CAMERON MEADOWS, LA.

Gravity—	Jan. 1
Below 18	$0.74
18-18.9	.76
19-19.9	.78
20-20.9	.80
21-21.9	.82
22-22.9	.85
23-23.9	.88
24-24.9	.91
25-25.9	.94
26-26.9	.97
27-27.9	.99
28-28.9	1.01
29-29.9	1.03
30-30.9	1.05
31-31.9	1.07
32-32.9	1.09
33-33.9	1.11
34-34.9	1.13

Posted by Magnolia Petroleum Co.

BATON ROUGE (UNIVERSITY), LOUISIANA

Gravity—	Jan. 1	Oct. 17
Below 20	$.79	...
20-20.9	.82	$.91
21-21.9	.85	.93
22-22.9	.88	.95
23-23.9	.91	.97
24-24.9	.94	.99
25-25.9	.97	1.01
26-26.9	1.00	1.03
27-27.9	1.02	1.05
28-28.9	1.04	1.07
29-29.9	1.06	1.09
30-30.9	1.08	1.11
31-31.9	1.10	1.13
32-32.9	1.12	1.15
33-33.9	1.14	1.17
34-34.9	1.16	1.19
35-35.9	1.18	1.20
36-36.9	1.20	1.21
37-37.9	1.22	1.22
38-38.9	1.24	1.23
39-39.9	1.26	1.24
40 and over	1.28	1.25

Posted by Standard Oil Co. of Louisiana.

GUEYDAN, SWEET LAKE, LA., AND LOUISE, TEXAS*

Gravity—	Jan. 1	Oct. 2
Below 20	$0.79	$0.86
20-20.9	.82	.88
21-21.9	.85	.90
22-22.9	.88	.92
23-23.9	.91	.94
24-24.9	.94	.96
25-25.9	.97	.98
26-26.9	1.00	1.00
27-27.9	1.02	1.02
28-28.9	1.04	1.04
29-29.9	1.06	1.06
30-30.9	1.08	1.08
31-31.9	1.10	1.10
32-32.9	1.12	1.12
33-33.9	1.14	1.14
34-34.9	1.16	1.16
35-35.9	1.18	1.18
36-36.9	1.20	1.20
37-37.9	1.22	1.22
38-38.9	1.24	1.24
39-39.9	1.26	1.26
40 and over	1.28	1.28

Posted by Pure Oil Co.

*Effective Oct. 23, 1940, Pure posted above prices also for Ganado field, Jackson County, Texas.

MIRANDO-DUVAL, BEAUMONT, TEXAS

Gravity—	Jan. 1
19-19.9	$0.86
20-20.9	.88
21-21.9	.90
22-22.9	.92
23-23.9	.94
24-24.9	.96
25-25.9	.98
26-26.9	1.00
27-27.9	1.02
28-28.9	1.04
29-29.9	1.06
30-30.9	1.08
31-31.9	1.10
32-32.9	1.12
33-33.9	1.14
34-34.9	1.16
35-35.9	1.18
36-36.9	1.20
37-37.9	1.22
38-38.9	1.24
39-39.9	1.26
40 and over	1.28

Posted by Humble Oil & Refining Co. Sun Oil Co. in Mirando alone, schedule on Jan. 1 stopped at 24°-24.9° at 96 cents; effective July 11 increased to 25°-25.9° at 98 cents with 26° and above, $1. By Stanolind Oil & Gas Co. in Beaumont alone. By Magnolia Petroleum Co. in Beaumont and Mirando. By Texas Co. in Duval and Mirando, stopping at 28°-28.9° at $1.09. Continental Oil Co. in Mirando and Duval.

Republic Oil Ref. Co. effective Dec. 5, 1940, posted Benavides, Longhorn, Southland, Sweden and Duval County and Heyser field at 20°-20.9°, 88 cents, with a 1-cent differential to 40° and above at $1.08.

ANAHUAC AND DICKINSON, TEXAS*

Gravity—	Jan. 1
Below 20	$0.81
20	.83
21	.85
22	.87
23	.89
24	.91
25	.93
26	.95
27	.97
27-27.9	.99
28-28.9	1.01
29-29.9	1.03
30-30.9	1.05
31-31.9	1.07
32-32.9	1.09
33-33.9	1.11
34-34.9	1.13
35-35.9	1.15
36-36.9	1.17
37-37.9	1.19
38-38.9	1.21
39-39.9	1.23

*Includes crudes purchased in Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Pierce Junction and Raccoon Bend (shallow).

Effective by Humble Oil & Refining Co. Oct. 2, 1939. By Sun Oil Co. in Anahuac, Oct. 2, 1939. By Gulf Refining Co. in Anahuac, Oct. 2, 1939. On Nov. 1, 1939, Gulf Refining Co. applied these prices to Anahuac, Hull (new), Pierce Junction, Orange, Thompson (deep).

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***SAFETY*—A five-point safety control system protects both men and equipment. Powder charges are regulated to give maximum penetration without damaging the casing. Firing is selective.**

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Lane-Wells invites you to inspect the Gun Perforating Equipment in the Branch nearest you. Check the safety features for yourself and you'll see why so many oil companies rely on Lane-Wells Gun Perforating Service to "get results" with safety.

CREOLE, LOUISIANA

	Jan. 1	June 10
Creole, La.	$0.96	$1.00

Posted by Pure Oil Co.

NORTH LOUISIANA AND ARKANSAS, SWEET*

Gravity—	Jan. 1	Oct. 17
24-24.9	$.73	$.73
25-25.9	.75	.75
26-26.9	.77	.77
27-27.9	.79	.79
28-28.9	.81	.81
29-29.9	.83	.83
30-30.9	.85	.85
31-31.9	.87	.87
32-32.9	.89	.89
33-33.9	.91	.91
34-34.9	.93	.93
35-35.9	.95	.94
36-36.9	.97	.95
37-37.9	.99	.96
38-38.9	1.01	.97
39-39.9	1.03	.98
40 and over	1.05	.99

Posted by Standard Oil Co. of Louisiana and Lion Oil Refining Co.

*Includes Caddo, De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, El Dorado (West, South and Rainbow) and Schuler (Morgan sand).

BUCKNER, MAGNOLIA AND VILLAGE, ARKANSAS

Gravity—	Jan. 1	Oct. 17
Below 21		$.55
21-21.9		.57
22-22.9		.59
23-23.9		.61
24-24.9		.63
Below 25	$.63	
25-25.9	.65	.65
26-26.9	.67	.67
27-27.9	.69	.69
28-28.9	.71	.71
29-29.9	.73	.73
30-30.9	.75	.75
31-31.9	.77	.77
32-32.9	.79	.79
33-33.9	.81	.81
34-34.9	.83	.83
35-35.9	.85	.84
36-36.9	.87	.85
37-37.9	.89	.86
38-38.9	.91	.87
39-39.9	.93	.88
40 and over	.95	.89

Posted by Standard Oil Co. of Louisiana and Lion Oil Refining Co.

NORTH LOUISIANA AND ARKANSAS

	Jan. 1	Oct. 17
Shreveport (Cross Lake), La.*	$1.05	$1.05
Smackover, Ark. (heavy)‖	.73	.73
Tullos and Urania, La.‡	.89	.89
Cotton Valley (distillate), La.†	1.20	1.10
Cotton Valley crude†	1.05	1.05
Cotton Valley (Holloway sand)†	1.00	1.10
Big Creek, Dorcheat, McKamie distillates (sour)	$1.00	.95
Rodessa, La.	(¶)	1.05

*Posted by Caddo Crude Oil Purchasing Co. and Atlas Oil Corp. †Posted by Standard Oil Co. of Louisiana. ‡Posted by Hunt Oil Co. and Standard Oil Co. of Louisiana. §Posted Feb. 10, 1940. ¶Took North Louisiana-Arkansas price schedule. ‖Posted by Magnolia Petroleum Co., Gulf Refining Co., McMillan Refining Co., Cross Refining Co. and Standard Oil Co. of Louisiana.

LISBON, LOUISIANA

Gravity—	Jan. 1
27-27.9	$.66
28-28.9	.68
29-29.9	.70
30-30.9	.72
31-31.9	.74
32-32.9	.76
33-33.9	.78
34-34.9	.80
35 and above	.82

Posted by Gulf Refining Co. and Caddo Crude Oil Purchasing Co.

BUNKIE, EOLA AND OLLA, LOUISIANA

Gravity—	Jan. 1	Oct. 17
24-24.9	$.83	$.83
25-25.9	.85	.85
26-26.9	.87	.87
27-27.9	.89	.89
28-28.9	.91	.91
29-29.9	.93	.93
30-30.9	.95	.95
31-31.9	.97	.97
32-32.9	.99	.99
33-33.9	1.01	1.01
34-34.9	1.03	1.03
35-35.9	1.05	1.04
36-36.9	1.07	1.05
37-37.9	1.09	1.06
38-38.9	1.11	1.07
39-39.9	1.13	1.08
40 and over	1.15	1.09

Posted by Standard Oil Co. of Louisiana.

SCHULER (JONES SAND AND REYNOLDS LIME), ARKANSAS

Gravity—	Jan. 1*	Oct. 17
Below 21		$.55
21-21.9		.57
22-22.9		.59
23-23.9		.61
24-24.9		.63
25-25.9		.65
26-26.9		.67
27-27.9		.69
28-28.9		.71
29-29.9		.73
30-30.9		.75
31-31.9		.77
32-32.9		.79
33-33.9		.81
34-34.9		.83
35-35.9		.84
36-36.9		.85
37-37.9		.86
38-38.9		.87
39-39.9		.88
40 and over		.89

Posted by Lion Oil Refining Co. and Standard Oil Co. of Louisiana.

*Schuler (Jones sand) was posted at a flat 79-cent price and Reynolds lime a flat 91 cents by Lion Oil.

SOUTH LOUISIANA, SOUR*

Gravity—	Jan. 1	Oct. 17
Below 21	$.74	$.75
21-21.9	.77	.77
22-22.9	.80	.79
23-23.9	.83	.81
24-24.9	.86	.83
25-25.9	.89	.85
26-26.9	.92	.87
27-27.9	.94	.89
28-28.9	.96	.91
29-29.9	.98	.93
30-30.9	1.00	.95
31-31.9	1.02	.97
32-32.9	1.04	.99
33-33.9	1.06	1.01
34-34.9	1.08	1.03
35-35.9	1.10	1.04
36-36.9	1.12	1.05
37-37.9	1.14	1.06
38-38.9	1.16	1.07
39-39.9	1.18	1.08
40 and over	1.20	1.09

Posted by Standard Oil Co. of Louisiana.

*Includes Bayou de Glaise, Bayou Mallet, Choctaw, Darrow, Jeanerette, Lirette, North Crowley, Port Barre, Potash, Roanoke and St. Martinsville.

ROCKY MOUNTAIN STATES

Dry Creek, Mont. (Oct. 11, 1938)*	$0.92
Elk Basin, Wyo. (Oct. 11, 1938)*†	.90
Grass Creek, light, Wyo. (Oct. 11, 1938)*†	.90
Grass Creek, heavy (Oct. 11, 1938)†	.40
Lance Creek, Wyo. (Oct. 11, 1938)*‡	.77
Rock Creek, Wyo. (Oct. 11, 1938)*	1.00
Iles, light, Colo. (Oct. 11, 1938)†	.98
Iles, heavy, Colo. (Oct. 11, 1938)†	.92
Dutton Creek, Wyo. (Oct. 11, 1938)†	See note below
Frannie, light, Wyo. (Oct. 11, 1938)†	$0.55
Frannie, heavy, Wyo. (Oct. 11, 1938)†	.42
Hamilton dome, Wyo. (Oct. 11, 1938)†	.35
Midway, Wyo. (Oct. 11, 1938)†	See note below
Salt Creek Tensleep Crude, Wyo. (Oct. 11, 1938)†	$0.646
Salt Creek (Oct. 11, 1938)	See note below
Canon City, Colo. (Oct. 11, 1938)‡	$0.90
Florence, Colo. (Oct. 11, 1938)‡	.90
Cut Bank, Mont. (Jan. 1, 1940)¶	1.00
Kevin-Sunburst, Mont. (Jan. 1, 1940)¶	.80
Cat Creek, Mont. (Oct. 11, 1938)‡	1.10
Big Muddy, Wyo. (Oct. 11, 1938)‡	.98
Lea County, New Mexico	See West Texas gravity schedule‡
Artesia, Jackson, and Maljamar	See gravity table‡
Fort Collins and Wellington, Colo.	See note below
Eddy County, New Mexico	See note below

*Ohio Oil Co. †Stanolind Oil & Gas Co. ‡Continental Oil Co. §Sinclair Prairie Oil Marketing Co. ¶Producers Refining Co.

Dutton Creek and Salt Creek Tensleep crudes start at below 29°, 86 cents, 2-cent spread up to 40° and over at $1.10. Salt Creek crude, excepting Tensleep, takes Standard Oil Co. of Indiana's Oklahoma-Kansas prices. Stanolind Oil & Gas Co., effective Oct. 11, 1938, discontinued posting prices in Greybull-Torchlight, Wyoming, and Hogback and Hospah, New Mexico. In Fort Collins and Wellington, Colorado, effective Oct. 11, 1938, by Continental Oil Co. 28-28.9°, 81 cents, with 2 cents added for each degree up to 40° and over at $1.05. In Eddy County, until April 22, 1940, Continental posted flat price of 77 cents; effective that date, Continental schedule starts at 28°-28.9°, 61 cents, with a 2-cent spread to 40° and over at 85 cents.

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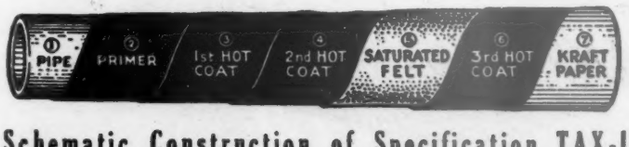

Schematic Construction of Specification TAX-1

GENERAL PAINT CORPORATION
HILL, HUBBELL & CO. • Division • Cleveland, Ohio
• EXPORT OFFICE, SAN FRANCISCO, CALIFORNIA, U. S. A. •

CALIFORNIA CRUDE-OIL PRICES

Gravity—	Signal Hill Long Beach El Segundo Jan. 1	Signal Hill Long Beach El Segundo Feb. 1	Wilmington Jan. 1	Wilmington Feb. 1	Seal Beach Jan. 1	Seal Beach Feb. 1	Huntington Beach Jan. 1	Huntington Beach Feb. 1	Inglewood Jan. 1	Inglewood Feb. 1	Playa Del Rey Jan. 1	Playa Del Rey Feb. 1	Olinda-Brea Canyon Jan. 1	Olinda-Brea Canyon Feb. 1	Coalinga Jan. 1	Coalinga Feb. 1	Torrance Jan. 1	Torrance Feb. 1	Richfield Jan. 1	Richfield Feb. 1
14-14.9	$.80	$.65	$.75	$.60	$.79	$.64	$.78	$.63	$.79	$.64	$.80	$.65	$.76	$.61	$.70	$.60	$.80	$.65	$.76	$.61
15-15.9	.80	.65	.75	.60	.79	.64	.78	.63	.79	.64	.80	.65	.76	.61	.70	.60	.80	.65	.76	.61
16-16.9	.80	.65	.75	.60	.79	.64	.78	.63	.79	.64	.80	.65	.76	.61	.70	.60	.80	.65	.76	.61
17-17.9	.80	.65	.77	.62	.79	.64	.78	.63	.81	.68	.80	.65	.76	.61	.70	.60	.80	.65	.76	.61
18-18.9	.80	.65	.79	.64	.79	.64	.78	.63	.84	.71	.80	.65	.78	.65	.70	.60	.82	.68	.76	.61
19-19.9	.82	.69	.82	.69	.79	.64	.82	.67	.87	.75	.84	.70	.81	.69	.71	.61	.85	.72	.76	.61
20-20.9	.85	.73	.85	.73	.79	.64	.85	.72	.90	.79	.88	.76	.84	.74	.72	.62	.88	.75	.78	.65
21-21.9	.88	.78	.88	.78	.79	.64	.89	.76	.93	.82	.93	.81	.88	.78	.74	.66	.91	.79	.80	.69
22-22.9	.92	.82	.92	.82	.82	.69	.92	.81	.96	.86	.98	.86	.92	.82	.78	.70	.93	.82	.84	.73
23-23.9	.95	.86	.95	.86	.86	.75	.96	.85	.99	.89	1.02	.92	.96	.86	.82	.74	.96	.86	.88	.78
24-24.9	.99	.90	.99	.90	.91	.80	1.00	.90	1.02	.93	1.06	.97	.99	.90	.86	.78	.99	.89	.91	.82
25-25.9	1.03	.95	1.03	.95	.95	.86	1.03	.94	1.05	.96	1.11	1.02	1.03	.95	.90	.82	1.02	.93	.95	.86
26-26.9	1.06	.99	1.06	.99	1.00	.91	1.07	.99	1.09	1 00	1.16	1.08	1.06	.99	...	...	1.05	.96	.98	.90
27-27.9	1.10	1.03	1.10	1.03	1.05	.97	1.11	1.03	1.12	1.04	...	...	1.10	1.03	...	...	...	1.00	1.02	.94
28-28.9	1.14	1.07	1.14	1.07	1.10	1.02	1.14	1.07	1.15	1.07	...	...	1.14	1.07	...	...	...	1.03	1.06	.98
29-29.9	1.17	1.10	1.17	1.10	1.15	1.07	1.18	1.11	1.18	1.10	f.o.b. pipe line	f.o.b. pipe line	1.17	1.10	...	...	...	1.06	1.09	1.02
30-30.9	1.21	1.14	1.21	1.14	1.19	1.12	1.22	1.15	1.21	1.14			1.21	1.14	...	...	...	1.09	...	...
31-31.9	...	...	...	...	...	...	...	...	1.24	1.17	...	...	1.24	1.17	...	...	...	...	...	...
32-32.9	...	...	...	...	...	...	...	...	1.27	1.20	...	...	1.27	1.20	...	...	...	...	...	...

CENTRAL AND NORTH TEXAS

Gravity—	Jan. 1
24-24.9	$0.71
25-25.9	.73
26-26.9	.75
27-27.9	.77
28-28.9	.79
Below 29	...
29-29.9	.81
30-30.9	.83
31-31.9	.85
32-32.9	.87
33-33.9	.89
34-34.9	.91
35-35.9	.93
36-36.9	.95
37-37.9	.97
38-38.9	.99
39-39.9	1.01
40 and over	1.03

Humble Oil & Refining Co. in Central Texas. Magnolia Petroleum Co. schedule in North and Central Texas, same as the Humble, excepting that it starts at below 29° at 79 cents. Texas Co. schedule in North and Central Texas, same as Magnolia, Gulf Refining Co. same as Magnolia's. Sinclair Prairie Oil Marketing Co., in Mexia and North Central Texas, same as Magnolia. Continental in North Texas same as Magnolia. Stanolind Oil Purchasing Co. schedule below 21°, 63 cents, with a 2-cent spread to 40° and over at $1.03, effective September 1, 1940.

EAST CENTRAL TEXAS

(Mexia District)

Gravity—	Jan. 1
23-23.9	$0.78
24-24.9	.80
25-25.9	.82
26-26.9	.84
27-27.9	.86
28-28.9	.88
Below 29	...
29-29.9	.90
30-30.9	.92
31-31.9	.94
32-32.9	.96
33-33.9	.98
34-34.9	1.00
35-35.9	1.02
36-36.9	1.04
37-37.9	1.06
38-38.9	1.08
39-39.9	1.10
40 and over	1.12

Humble Oil & Refining Co., Sinclair, Prairie Oil Marketing Co. starts at below 29°, 79 cents, with a 2-cent differential to $1.03 for 40° and over.

EAST TEXAS

	Jan. 1
East Texas	$1.10

Posted by all companies.

VAN, TEXAS

	Jan. 1
Van, Texas	$0.93

Humble Oil & Refining Co.

TALCO

	Jan. 1
Talco field	$0.65

Humble Oil & Refining Co.

CASS AND PANOLA COUNTIES, TEXAS

	Jan. 1
Cass and Panola counties	(*)

*Posted by Magnolia Petroleum Co. at below 25°, 73 cents, with 2-cent spread up to 40° and over at $1.05. Texas Co. posts flat price of $1.05 for Cass County.

RODESSA, TEXAS

	Jan. 1
Rodessa, Tex.	(*)

*See North Louisiana-Arkansas price schedule.

CAYUGA, TEXAS

	Jan. 1
Cayuga, Tex.	$.78

Posted by Pan American Pipe Line Co.

Gravity—	Montebello Jan. 1	Montebello Feb. 1	Santa Fe Springs Jan. 1	Santa Fe Springs Feb. 1	Greeley-Canal Jan. 1	Greeley-Canal Feb. 1	Kettleman Hills Jan. 1	Kettleman Hills Feb. 1	Athens-Rosecrans Jan. 1	Athens-Rosecrans Feb. 1	Rio Bravo May 18	Coles Levee and Tupman Jan. 1	Coles Levee and Tupman May 18
14-14.9	$.77	$.62	...	...	...	...	...	...	...	...	...	...	...
15-15.9	.77	.62	...	...	...	...	...	...	...	...	...	...	...
16-16.9	.77	.62	...	...	...	...	...	...	...	...	...	...	...
17-17.9	.77	.62	...	...	...	...	...	...	...	...	...	...	...
18-18.9	.77	.62	...	...	...	...	...	...	...	...	...	...	...
19-19.9	.77	.62	...	...	...	...	...	...	...	...	...	...	...
20-20.9	.77	.62	...	...	...	...	...	...	...	...	...	...	...
21-21.9	.77	.62	$.78	$.63	...	...	...	...	...	...	...	...	...
22-22.9	.79	.66	.78	.63	...	...	...	...	...	...	...	...	...
23-23.9	.82	.71	.78	.67	...	...	...	...	$.84	$.71	...	...	...
24-24.9	.85	.75	.82	.72	...	...	...	...	.88	.77	...	...	...
25-25.9	.89	.80	.86	.77	...	...	...	...	.93	.82	...	...	...
26-26.9	.93	.84	.90	.82	...	...	...	...	.98	.88	...	...	...
27-27.9	.97	.89	.95	.87	$.91	$.83	...	...	1.03	.94	$.83	$1.00	$.92
28-28.9	1.01	.93	.99	.91	.94	.86	...	...	1.07	.99	.86	1.03	.96
29-29.9	1.06	.98	1.03	.96	.98	.90	...	...	1.12	1.04	.90	1.06	.99
30-30.9	1.10	1.02	1.08	1.01	1.02	.94	...	...	1.17	1.09	.94	1.09	1.02
31-31.9	1.14	1.07	1.12	1.05	1.06	.98	...	...	1.22	1.14	.98	1.13	1.06
32-32.9	1.18	1.11	1.16	1.09	1.09	1.02	...	...	1.27	1.19	1.02	1.16	1.09
33-33.9	1.22	1.15	1.20	1.14	1.13	1.06	$1.19	$1.12	1.32	1.24	1.06	1.19	1.13
34-34.9	1.26	1.20	1.25	1.19	1.17	1.10	1.23	1.17	1.37	1.29	1.10	1.22	1.16
35-35.9	1.30	1.24	1.29	1.23	1.20	1.14	1.27	1.21	1.42	1.34	1.14	1.26	1.20
36-36.9	1.34	1.28	1.33	1.27	1.24	1.18	1.31	1.25	1.46	1.39	1.18	1.29	1.23
37-37.9	1.38	1.33	1.37	1.31	1.28	1.22	1.35	1.29	1.51	1.44	1.22	1.32	1.26
38-38.9	1.42	1.37	1.42	1.36	1.31	1.25	1.39	1.33	1.56	1.49	1.25	1.35	1.30
39-39.9	1.47	1.42	...	...	1.35	1.29	1.43	1.38	1.61	1.54	1.29	1.39	1.34
40-40.9	1.51	1.46	...	...	1.39	1.33	...	...	1.66	1.59	1.33	1.42	1.37
41-41.9	1.55	1.50	...	...	1.43	1.37	...	...	...	...	...	1.45	1.40
42-42.9	1.59	1.54	...	...	1.46	1.41	...	...	...	...	...	1.48	1.44
43-43.9	1.63	1.59	...	...	1.50	1.45	...	...	...	...	...	1.51	1.47
44-44.9	1.67	1.63	...	...	1.54	1.49	...	...	...	...	...	1.55	1.51
45-45.9	1.71	1.67	...	...	1.57	1.53	...	...	...	...	...	1.58	1.54
46-46.9	1.75	1.71	...	...	1.61	1.57	...	...	...	...	...	1.61	1.57
47-47.9	...	...	...	...	1.65	1.61	...	...	...	...	...	...	...
48-48.9	...	...	...	...	1.68	1.64	...	...	...	...	...	...	...

Gravity—	Orcutt Jan. 1	Santa Maria Jan. 1	Lost Hills Jan. 1	Lost Hills Feb. 1	Santa Paula Jan. 1	Santa Paula May 18	Buena Vista Hills, Midway-Sunset, Lakeview area, Elk Hills Jan. 1	Buena Vista Hills, Midway-Sunset, Lakeview area, Elk Hills Feb. 1	Mountain View Jan. 1	Mountain View Feb. 1	West Coyote Hills Jan. 1	West Coyote Hills Feb. 1	Whittier East Coyote (La Habra) Jan. 1	Whittier East Coyote (La Habra) Feb. 1
14-14.9	...	$.42	$.70	$.60	$.70	$.60	$.70	$.60	...	...	$.78	$.63	$.76	$.61
15-15.9	...	.44	.70	.60	.70	.60	.70	.60	...	...	.78	.63	.76	.61
16-16.9	$.60	.45	.70	.60	.70	.60	.70	.60	...	...	.78	.63	.76	.61
17-17.9	.60	.46	.70	.60	.71	.61	.70	.60	...	...	.78	.63	.76	.61
18-18.9	.62	...	.70	.60	.73	.63	.70	.60	...	...	.78	.63	.76	.61
19-19.9	.65	...	.74	.64	.75	.65	.74	.64	$.70	$.60	.78	.63	.78	.65
20-20.9	.68	...	.78	.69	.77	.67	.78	.69	.70	.60	.80	.67	.82	.69
21-21.9	.71	...	.82	.74	.79	.70	.82	.74	.73	.64	.84	.72	.85	.73
22-22.9	.74	...	.86	.78	.82	.73	.87	.79	.77	.68	.88	.76	.89	.77
23-23.9	.77	...	.90	.82	.85	.76	.92	.84	.80	.71	.92	.81	.93	.82
24-24.9	.80	...	.94	.86	.87	.79	.97	.89	.84	.75	.96	.85	.96	.86
25-25.9	.83	...	.98	.90	.90	.82	1.01	.94	.88	.79	.99	.89	...	.90
26-26.9	.86	...	1.02	.95	.92	.85	1.06	.99	.91	.83	1.03	.94	...	.94
27-27.9	...	...	1.06	.99	.95	.88	1.10	1.04	.95	.87	1.06	.98	...	.98
28-28.9	...	...	1.10	1.03	.97	.90	1.15	1.09	.99	.91	1.10	1.02	...	...
29-29.9	...	...	1.14	1.07	.99	.92	1.20	1.14	1.02	.95	1.14	1.06	...	...
30-30.9	...	...	1.18	1.11	1.01	.94	1.25	1.19	1.06	.99	1.17	1.10	...	...
31-31.9	...	...	...	...	...	...	1.29	1.24	1.09	1.02	1.21	1.14	...	...
32-32.9	...	...	...	...	...	...	1.34	1.29	1.13	1.06	1.25	1.18	...	...
33-33.9	...	...	...	...	...	...	1.38	1.34	1.17	1.10	1.28	1.22	...	...
34-34.9	...	...	...	...	...	...	...	...	1.20	1.14	1.32	1.26	...	...

For Newhall, McKittrick, Kern River, Round Mountain and Kern Front crude, Standard posts 60 cents per barrel for all grades. For Elwood Terrace crude (free on board ship), 33°-33.9°, $1.21, with 4 cents added for each degree up to and including 37° and over at $1.37; Wheeler Ridge crude, 19° to 21.9°, 60 cents; 22°-22.9°, 63 cents; 23°-23.9°, 67 cents; 24°-24.9°, 71 cents; 25° and over, 75 cents. On May 18, Union Oil Co. adopted Standard of California prices in all fields in which they both purchase.

CLAY CREEK, TEXAS

	Jan. 1
Clay Creek, Tex.	$.85

Posted by Sun Oil Co.

LONG LAKE, TEXAS

	Jan. 1
Long Lake, Tex.	$1.08

Posted by Sinclair Oil Marketing Co.

SOUTHWEST TEXAS

	Jan. 1
Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski*	$0.96
Pettus*	1.29
Flour Bluff (Dec. 3, 1930*)	1.23
Luling†	.87
Lytton Springs†	.99
Jim Wells County (Oct. 2, 1939)*	1.23
Darst Creek (Oct. 12, 1938)†	.96
Darst Creek and Bruner (Oct. 13, 1938)‡	.96
Government Wells (Oct. 13, 1938)	See note below

*Humble Oil & Refining Co. †Magnolia Petroleum Co. Pettus price adopted by Atlantic Crude Oil Purchasing Co. ‡Gulf Refining Co.

Government Wells posted by Sun Oil Co. starts at 20° at 77 cents, 3-cent spread to 24-24.9° at 89 cents.

REFUGIO, GRETA, SAXET, EAST WHITE POINT, O'CONNOR-McFADDEN, PLYMOUTH, TOMOCONNOR AND TAFT TEXAS

Gravity—	Jan. 1
Below 20	$0.91
20-20.9	.93
21-21.9	.95
22-22.9	.97
23-23.9	.99
24-24.9	1.01
25-25.9	1.03
26-26.9	1.05
27-27.9	1.07
28-28.9	1.09
29-29.9	1.11
30-30.9	1.13
31-31.9	1.15
32-32.9	1.17
33-33.9	1.19
34-34.9	1.21
35-35.9	1.23
36-36.9	1.25
37-37.9	1.27
38-38.9	1.29
39-39.9	1.31
40-40.9	1.33

Effective Oct. 2, 1939, by Humble Oil & Refining Co. and Continental Oil Co. By Texas Co. up to 28° and over at $1.09 Oct. 2, 1939. Atlantic adopted Humble price schedule Nov. 7, 1939, in Refugio and applied it also to Greta.

Republic Oil Ref. Co. effective Dec. 5, 1940, posted Saxet, Plymouth, Midway, East White Point and Minnie Rock, 20°-20.9°, 93 cents with 1-cent differential to 40° and over at $1.13.

CANADA

ONTARIO

By Imperial Oil, Ltd.	Jan. 1	July 18	Sept. 12
Petrolia	$2.10	$2.10	$2.10
Oil Springs	2.07	2.07	2.07
Bothwell	2.10	2.10	2.10

TURNER VALLEY

Clear naphtha and discolored naphtha, 65° and higher	2.14	2.14	...
Discolored naphtha and crude oil, 40-40.9°	1.14	1.19	...
Increasing 2 cents for each degree gravity with top price for 64° and over	1.62	*1.67	†1.70

These prices f.o.b. producers field tankage. *July 18 price schedule starts at $1.05 for 33-33.9°. †Crude-oil price schedule starts at $1.08 for 33-33.9°.

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THE BABCOCK & WILCOX TUBE COMPANY, BEAVER FALLS, PA.

TA-1128

Fishing jobs due to washouts in the thread connections between the drill collars and reamers on rotary drill stems can often be avoided by inspection of the joints when the tools are out of the hole. Some contractors and superintendents insist that all of the joints below the top drill collar, reamer or stabilizer be broken, doped and made up tight with the tongs. The accompanying picture shows a reamer being tightened on a drill collar after being inspected. Grease which has been forced out of the joint can be seen below the backup tongs

ENGINEERING & OPERATION

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PRODUCTION OF SEMINOLE DISTRICT BOLSTERED BY HIGHER EFFICIENCY
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In the Seminole area of Oklahoma operators during recent years have devoted attention to methods which would reduce the decline in output to a minimum and at the same time provide increased revenue. Exploitation of sands formerly overlooked, plugging back of depleted wells to upper pay zones or deeper drilling into new pays, changes in operating practices and type of pumping equipment, and increasing pumping efficiency through repair work have all contributed toward bolstering production.

SMALL-BORE PUMPS EMPLOYED IN SOUTHEASTERN KANSAS
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In the shallow shoestring-sand fields of southeastern Kansas, wide use is being made of small-bore pumps to increase production and reduce the pumping load.

LABORATORY EVALUATION OF PETROLEUM PRODUCTS
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In the refining industry need for evaluation of petroleum fractions is generally recognized as the refiner must accurately know the yields and characteristics of the various fractions in order to balance his operations. This article presents the results of complete evaluations of several different petroleum products, including two natural gasolines, a distillate and a crude oil.

SUGGESTED FIELD PRACTICES, No. 13—Weeding Out Profitless Wells
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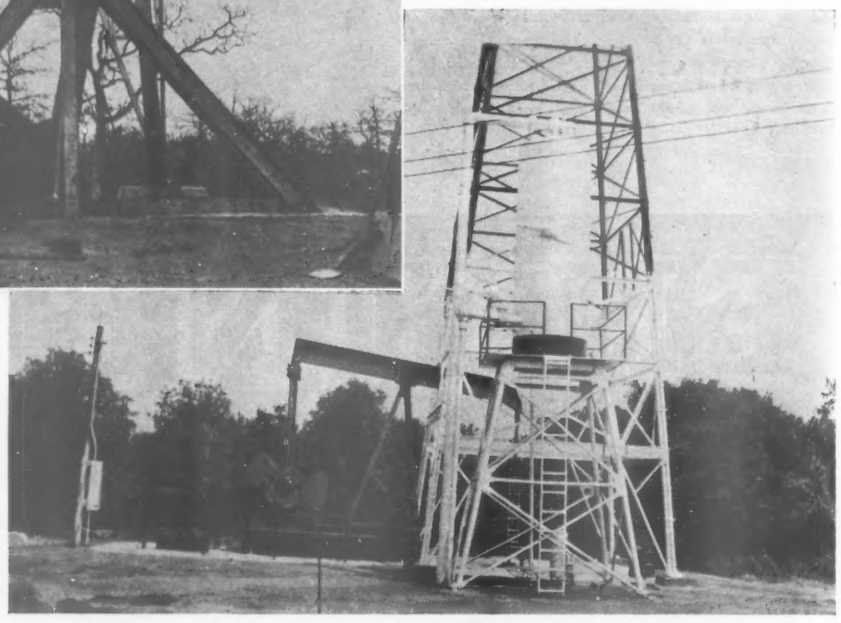
Production of Seminole District Bolstered by Higher Efficiency

By HARRY F. SIMONS



Above: Cleanup time on a lease. After the jack has been washed with kerosene, it will be painted. Right: Large double-crank pumping unit driven by an electric motor on a lease in the Seminole area. The separator was installed when the well was flowing.

COMPANIES in the Seminole area, one of Oklahoma's most important oil-producing regions, have turned their attention in the past few years to methods which will reduce the decline in output to a minimum and at the same time provide increased revenue. Production in the area has declined from 100,051,000 bbl. in 1930 to 40,467,000 bbl. in 1940. A sharp drop occurred in 1931 when the region produced 63,860,000 bbl., after which the region gradually declined to 42,528,000 bbl. in 1938. The decline during the past 2 years has been 4.9 per cent.

Seminole includes all of Seminole County and parts of Pottawatomie, Pontotoc, Hughes, Okfuskee and McClain counties. It is an area approximately 50 miles from north to south and 40 miles from east to west. It contains more than 40 separate pools, most of which are more than 10 years old. Production in the area comes from numerous horizons, the most important being the Wilcox sand. Others include Simpson dolomite, Hunton lime, Misener sand, Viola lime, Cromwell, Senora, Calvin and Earlsboro sands. Many of these formations have several producing zones and some fields produce from a combination of horizons. (History of the area was given by W. V. Howard in The Oil and Gas Journal, Feb. 22, 1940.)

The exploitation of sands formerly overlooked has been an important factor in sustaining production in the area. The plugging back of depleted oil wells to upper pay zones, greater penetration of pay or deepening to a new pay zone, have all been effectively used. In some cases, new wells have been drilled to the upper pays when the plug-back work in a field showed that the recovery would justify the expense. This is an important phase of the operation of the various companies and has contributed substantially to the recovery from the area.

Changes in operating practice have been equally important and have resulted in substantial increases in the amount of oil produced from some wells and a general reduction in the costs of obtaining the production. Several years ago it was the opinion of many that oil wells naturally declined and there was little the operator could do about it. One method of keeping a property profitable was to cut the operating costs by reducing the maintenance work.

This attitude has been recently changed and at the present time many of the properties in the Seminole area look better than they did 5 years ago. Equipment has been modernized in many cases, the investment necessary to obtain greater efficiency being more than offset by the increased revenue. Wells have been repaired and now make more oil than formerly. Changes in the type of pumps used in a particular well have been very effective in many cases. Properties have been consolidated and expenses reduced in that manner.

Beam Pumps

Most of the wells in the Seminole area were completed as flowing wells but for a number of years have been pumped with some type of beam pump. As many of them were completed with cable tools, the standard pumping rig, consisting of engine, band wheel and beam, is quite common; some are equipped with countershafts. On later wells, geared pumping units have been installed with an internal-combustion engine or electric motor driving them.

Characteristics of the wells vary widely and it is not uncommon to pass a single lease on which some of the beams will be operating on a long, fast stroke, some on a short, slow stroke and some at medium lengths and speeds. In some areas, intermittent pumping is used, the beams being shut down part of the day. This method is used on wells which do not make sufficient oil to justify 24-hour pumping and on wells which are pumper-flowers. After a short period of pumping, this latter type well will flow for some time. Electric pumping units with automatic controls are particularly well suited for this type operation.

Variation in well characteristics has prevented the adoption of central-power units, although there are a few of these in operation. Some of them are of the band-wheel type and others are the geared type. A modified central-pumping arrangement has been used successfully by some operators. This consists of a four-wheel unit which has twin cranks and a gear box and is driven by either a multicylinder or a horizontal-type engine. Each crank is connected to a stroke post, which in turn is connected to two jacks by rod lines; rotary counterbalances are used on these units. It is often possible to find a lease on which four wells have pumping requirements sufficiently close to allow the use of this method.

Most of the wells are equipped with 2½-in. tub-

ing and a combination string of rods. Generally ⅞-in. rods are used for the top 1,700 ft. and ¾-in. rods for the bottom 2,300 ft. This arrangement will handle approximately 700 bbl. of fluid per day. As an average of approximately 4 bbl. of water is produced with each barrel of oil, it is evident that some wells have a fluid capacity too high to handle with a beam pump. In such cases, electrical centrifugal pumps or fluid-drive bottom-hole pumps are used. There are some of both types in use in the Seminole area.

The pump for a particular well is selected on basis of that well's requirements. This leads to a wide variety of pumps being used in the Seminole area and what might be characterized as an almost total lack of standardization. Experience has shown that any saving gained through the use of one particular type pump in a large number of wells is more than offset by a loss in production from some of the wells. By fitting the pump to the well it has been possible to show an increased income with little additional expense.

In many cases it has been possible to increase the production of a group of wells through the installation of a new pump and one better fitted for the job. In some cases the increase has run as much as 300 per cent. In addition, it has been possible to reduce the rod and tubing jobs to the point where the number of cleanout machines working in an area has been reduced by 50 per cent.

One method of increasing the pumping efficiency has been through the testing of wells to determine how fast the fluid is coming into the well bore. The fluid level is determined by a sonic measuring machine. If the fluid is coming faster than the present pump in the well can handle it, a pump having a higher capacity is installed; if the well is not making a fluid volume comparable to the pump capacity, the size of the pump is reduced.

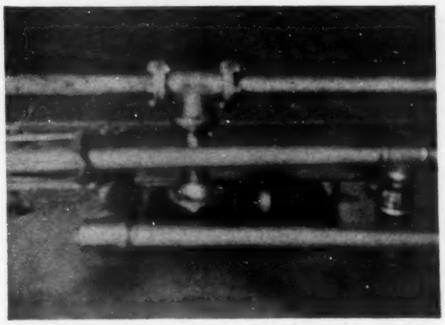
Determining Pump Efficiency

Volumetric tests are run to determine the efficiency of the pump and whether or not it should be pulled and repaired. The amount of clearance to allow before the pump is replaced, providing it has good efficiency, is debatable. If the pump has too much clearance a churning effect will result and the well will produce an emulsion; this will add to the treating costs. Whenever a well shows an increase in the amount of emulsion produced, the pump is replaced.

Pumps last varying periods, depending on the type and the well. In some cases, as little as 60 days' service is obtained, while in others pumps have shown satisfactory performance for as long as 18 months and were still 60 to 65 per cent efficient.

Some companies maintain a stock of parts and repair their own pumps. This is possible where the well characteristics have permitted a moderate amount of standardization. Where a company is operating a wide variety of pumps, it has proved cheaper to send them to local repair shops. This is a thriving business in the Seminole area.

Wells which have little water production also have low fluid levels. It has been possible in many cases to increase the production substantially by placing the pump as low as possible. Top seating of the pumps is necessary in many wells to get the pump at the desired depth. In one case a 50-bbl. well was increased to 200 bbl. by a little cleaning out and changing of the seating of the pump. The increase due to the change in pump location was determined by running tests on the well with differently located pumps before and after cleaning out.



Vaporproof thief hatch on tank which automatically cuts off tank from rest of battery and allows only vapors from tank being thieved to escape

Many wells have trouble with gas-locking and gas-pounding. Gas anchors have been run in some of the more troublesome wells and in others it has been possible to eliminate this difficulty by closer spacing of the traveling and standing valves.

A modification of the pumps has been successful in overcoming the trouble due to the deposit of gypsum in wells in one district. A pump having a barrel with a hardened cast-iron liner and a plunger made from chrome steel is used. The outer case of the pump is extended at the top and bottom, and travel of the plunger increased to allow its clearing both ends of the barrel on each stroke. This prevents gyp from depositing in the ends of the barrel and plugging the pump.

Workover Jobs

Production in many of the wells has been increased by working over. Some of the sand wells respond very well to light shots of 10 to 30 qt. of nitroglycerin, the well being later cleaned out with a sand pump. A method which has been particularly successful on one type well uses a comparatively heavy acid treatment (1,000 to 3,000 gal.). These wells are generally the ones in which the casing was set high and were drilled in with cable tools. In some of these wells a dolomite and a sandy dolomite streak may be present. Acidization of these zones generally produces good results.

Wells which produce a high amount of gyp often cause trouble with a deposit plugging both the formation and the pumps. Application of 200 to 500 gal. of acid will often remove the deposit in the pump barrel and open up the formation. Production in some of these wells has been increased as much as 300 per cent.

Determining the source of water and potential thief zones and sealing them off has been beneficial. Where all of the pay section has not been originally drilled, deepening has been helpful, but is undertaken with some trepidation because of the danger of encountering water.

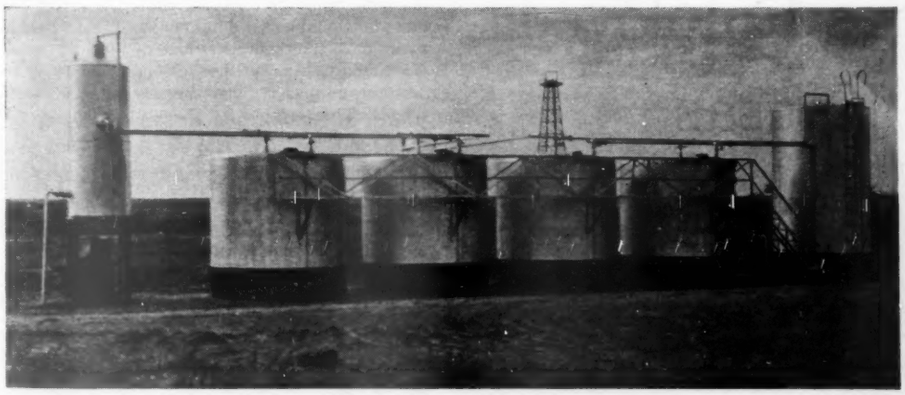
Surface Equipment

Many of the changes in surface equipment have been accompanied with a minimum of outlay. Frequently a more efficient property has been obtained by simply trading equipment between leases so that each piece of machinery is suited to its particular task. Equipment which had been temporarily warehoused has been reclaimed and put to work, and machinery from areas which are being abandoned is repaired and placed in use.

New equipment is purchased when the property justifies it. Often this is necessary to obtain the desired operating efficiency, the old equipment on the lease being discarded and sold for junk. This is particularly true of the old standard pumping pumping rigs driven by a heavy gas engine. Many of these are fast approaching the point where the maintenance and fuel costs are excessive and some are being replaced with modern single or double-crank pumping units driven by an internal-combustion engine or electric motor.

Tankage

Lease storage tanks are being examined closely to determine if the vapor losses are excessively high with a consequent loss in volume and gravity of the oil. Inefficient tank batteries are either repaired and modernized with vaporproof hatches or are replaced by vaporproof tanks. In many



Left: Two tank batteries in one which replaced a number of obsolete batteries. The old separator at left serves as a settling tank for the two stock tanks at left. The tanks are vapor-proofed. Below: Repaired pumping-rig front. Field-shop samson and headache posts and steel beam replace the old wooden structure

cases it has been possible to eliminate several old tank batteries, which were costing hundreds of dollars a month through escaping vapors, by substituting one centrally located modern battery.

For each degree loss in gravity, the oil shrinks approximately 2.5 per cent. Older tank batteries used in the Seminole area are either 500 or 1,000-bbl. capacity and because many of the wells have a small output (5 to 10 bbl. daily) it is evident that some time is required to fill a tank. Almost a month may elapse between the time the oil is turned into the tank and the time the tank is topped out. During this time the oil is losing part of its lighter vapors and is shrinking in both volume and gravity. The loss of 1° of gravity A.P.I. from 1,000 bbl. of oil results in a 25-bbl. reduction in the amount of oil in the tank. (Clarence Glasgow, "Gravity Losses in Production and Handling of Crude Oil," The Oil and Gas Journal, January 2, 1941.)

In addition there is the important point of price differential of 2 cents per degree of gravity A.P.I. In many cases a little care may result in retaining the 0.1° of gravity which will allow the crude to be sold in the higher price bracket. This may necessitate some repair to the tank battery, a change in the method of treating or an increase in the efficiency of the pumper handling the lease. This latter has been a point receiving considerable attention and in many cases instructing the pumper in the proper method of handling the tank battery and gaging the tanks has resulted in important gravity savings. Most of the newer tank batteries are being maintained with 2 to 4 oz. pressure on them.

Treating

The method used for determining when tanks are losing their efficiency consists of keeping a record of the gravity and amount of oil run from each tank. A change in the gravity of the oil run from a particular tank is a danger signal and means that the tank is losing some of its vapors. In some cases the decline in gravity is slow but in others it is quite sharp.

In some parts of the Seminole area, gas for lease operation is getting scarce and has caused some changes in operation, principally in the method of treating oil. The method formerly used consisted of a heater and gun barrel or settling tank with a minimum of chemicals being used. An old boiler or heater was generally employed for increasing the temperature to break the emulsion.

Investigation revealed that in some cases the oil could be satisfactorily treated without heat or a substantial saving in fuel costs could be obtained by installation of a more efficient heater. Where heat is entirely eliminated or sharply curtailed, more chemical is required. Cold treating of the oil has resulted in a saving of about 1° gravity.

The chemical for the entire lease is introduced through a lubricator located on the well most remote from the tank battery. This allows close contact between the chemical and the crude oil before it enters the settling tank. The ratio of 1 gal. of chemical treater to approximately 480 bbl. of oil is used by one company. Several companies keep a chart of the amount of chemical used for the amount and degree of gravity of the oil produced. In case the tank bottoms begin to rise the amount of chemical is increased, later reduced when the trouble clears up. Lubricators through which chemical is added are strapped so the pumper can tell how much chemical is being added each tour. This system prevents overtreatment of the oil.

One company has installed small pumps at the tank batteries for the recirculation of the tank bottoms. As soon as tank is run into the pipe line, the bottom is pumped out and through the settling tank and back to the stock. This increases the amount of oil produced from the lease by eliminating the losses through the tank bottoms and at the same time cuts operating costs as it is not necessary to clean out the tanks.

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Small-Bore Pumps Employed In Southeastern Kansas

By PAUL REED

IN the Mid-Continent area small-bore pumps of diameters less than 1½ in. have been employed for several years by some operators where it is recognized that pumps of this class have advantages for certain purposes. When used in wells where large-capacity pumps are not required they frequently increase production and in deep wells the pumping load is much reduced.

A considerable number of smallest sizes of small-bore pumps are used in areas such as the vicinity of Corsicana, Mexia, Big Spring, McCamey, Freer and Wichita Falls, Tex.; Casper, Wyo.; Seminole, Wewoka, Cromwell, Sasakwa, Shidler, Kiefer, Sapulpa, and Tulsa, Okla., and in numerous pools in both eastern and western Kansas. In parts of Greenwood County, Kansas, a number of operators have found them to be effective in pumping oil from stripper wells in the Bartlesville sand and Mississippi lime at well depths ranging from 1,500 to 2,800 ft. Shoestring fields were developed between 1920 and 1926; gravity of this Bartlesville oil is approximately 40° A.P.I. Mississippi lime production was developed in 1916 and following years; gravity of this oil is 37°-41° A.P.I.

Most wells are equipped with standard working-barrel pumps. A large number of wells, however, are equipped with pumps of small bore (1-in. to 1⅜-in.) as well as larger sizes; most insert barrels employed have 1½-in. bores. The common practice in the area is to pump with central powers.

The small-bore pump has an advantage since it makes possible the pumping of production from a well over a greater length of time in situations where a larger-barrel pump would pump off quickly and pound down. By using the small-bore pump the operator can obtain the steady pumping which is desirable for a low-capacity well since the fluid level can be maintained at fairly near the same level for long periods of the day. Furthermore, if pounding on the fluid does occur, the smaller plunger minimizes the shock on equipment.

Because of the small amount of oil produced from each well in the area, few records of individual stripper-well production are available. On certain properties it has been observed that the use of small-bore pumps has led to increases of as much as 1 bbl. per day in wells which had been producing approximately 5 bbl. An examination of records of pumping equipment installed in the Greenwood and Butler County areas shows that the use of small-bore pumps is definitely favored more by some operators than others with properties operated under similar conditions.

In the prorated areas of western Kansas, the majority of the pumps used are 1¾-in. bore; in this area there is also a large number of 1¼-in. pumps. It is expected that changes in proration which would permit more oil to be produced from Kansas would lead to the installation of larger pumps in the fields of the western part of the state.

•

Questions and Answers

On a seven-line pull (four-sheave stationary block and three-sheave traveling block) is the load the same on all seven lines or on a ratio? Does doubling the line lessen the load on the derrick or casing pole? Where may I find further information on blocks and pulleys with reference to derrick lines, etc.?—J. C. M.

Roughly speaking, the load is the same on all the lines strung through the blocks, but due to the friction of the sheaves in the traveling and crown blocks, the pull is not actually the same on all the lines while hoisting or lowering the load. The fast (lead) line is subjected to a greater stress than any of the others. The efficiency of a system of blocks is computed by the formula:

$$E = \frac{1}{(1.04)\ (n - 1)}$$

Where:

n = number of lines strung through the blocks.

If you have the dead line anchored at the crown block you will have a six-line stringup, while if the dead line is fastened to the traveling block you will have a seven-line stringup. In the former case the value of $E = 82.19$ and in the latter $E = 79.03$.

The fast (lead) line pull factor is 0.2027 and 0.1807, respectively, and for fairly large loads the difference between this value and the theoretical value becomes an important amount. For a six-line pull with a load of 30,000 lb., the calculated fast-line pull would be 5,000 lb., while the actual fast-line pull would be 6,018 lb. The dead line would actually have the theoretical load of 5,000 lb.

Stringing up more lines lessens the load on the derrick and also reduces the intensity of loading shocks. The formula for the load on the derrick or casing pole is:

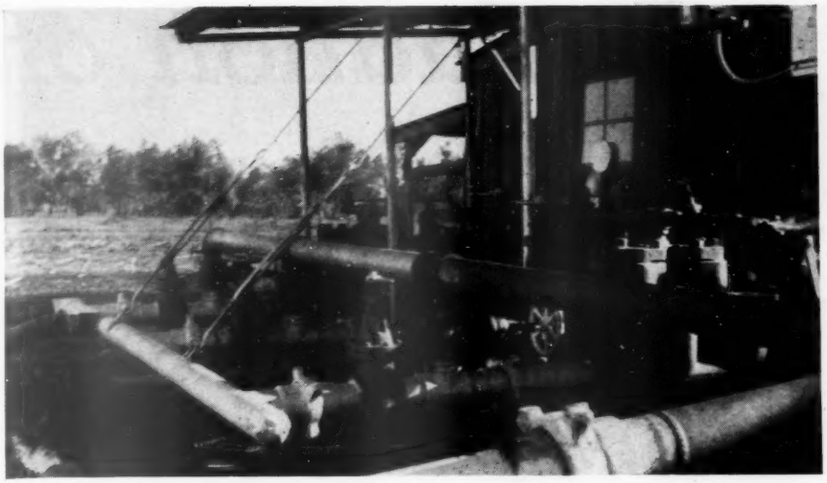
$$L = \frac{A}{B} P$$

Where:

A = number of lines through crown block
B = number of lines through traveling block
P = pull on traveling block.

Where six lines are strung through the traveling block, eight through the crown block and a total load of 30,000 lb. on the assembly, the total load on the derrick is (8/6) × 30,000 = 40,000 lb. Increasing from six to eight lines would give L = (10/8) × 30,000 = 37,500 lb. For running loads, such as the one with which you are concerned, the total load on the derrick (if complete accuracy is desired) should include the increase in pull occasioned by friction in the system as outlined above.

The Drilling Equipment Directory contains complete information on this subject. The standard college physics test gives all the necessary formulas for computing loads on lines and blocks and the mechanical advantage to be gained from different stringups. Driller's Wire Rope Handbook (Broderick & Bascom Rope Co.) and Wire Engineering (John Roebling's Sons Co.) also contain valuable information on this subject and on that of wire lines generally.



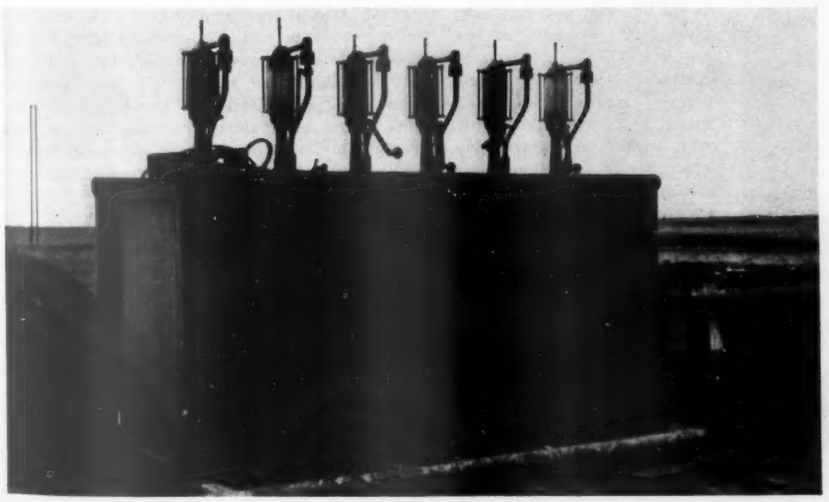
Guy Wires Suppress Suction Vibration

Strain on boiler feed-pump suction connections, normally caused by pump vibrations when under load, are suppressed or entirely eliminated by welding two eyes to the suction manifold, and through them tying the manifold to the truss of the pump-house roof through guys in which are set turnbuckles. The entire weight of the extended piping, valves and manifold may be taken by the guys, permitting connections to remain tight under pressure much longer than would be the case where they suspend on an overhang, or even blocked on the ground, as in the latter case they would have to carry vibration of the entire unit.

Operating Ideas

Compact Containers for Rig Lubricants

By welding a steel-pipe frame securely around a battery of six rectangular tanks, each with a capacity in excess of 55 gal., one rig provides a sturdy mount for its lubricant supply, and one which handles a maximum of oil with a minimum of space. Visible measuring pumps in each unit permit check of quantity and quality of oil being drawn, the flat top of the tank battery serving to support the container into which the oil is being pumped. Fresh oil, as brought to the rig, is unloaded into the proper section and the drum returned, eliminating the possible source of injury present when the men are required to shift heavy drums and pour from them on improvised racks or trestles.



Speed Wrench for Valve-Cap Nuts

Valve caps on mud pumps must be taken off frequently to remove sticks and other obstacles which get under the valves. One derrick man

devised the speed wrench shown above to reduce the time necessary to perform this task. It is made from an old lug wrench taken from a car and a socket taken from a regular wrench which is standard equipment with the pump. The nuts can be run up with this wrench and then finally tightened with a long-handled socket wrench.

Two Foundations Under Motor

Location of an electric rig in the Oklahoma City field required that the motor driving the draw works be about 12 ft. off of the ground. Instead of building a special foundation, the drilling contractor took a substructure from another rig and placed it on top of the regular substructure used with the rig. The bottom foundation was set parallel to the draw-works skids while the upper one was installed in the regular manner. A deadman was used to anchor the foundation in place.

Laboratory Evaluation of Petroleum Products

By K. E. CODY and D. M. LUNTZ
Gulf Coast Petroleum Laboratory, Inc., Houston, Tex.

Need for evaluation of petroleum fractions, both for control and for processing purposes, is generally recognized in the refining industry as the refiner must know accurately the yields and characteristics of the various fractions in order to balance out his operations. This article presents the results of complete evaluations of several different petroleum products and shows that such work is within the reach of small companies that do not have elaborate laboratories.

FOR many years the larger oil companies have realized the importance of properly evaluating petroleum fractions both for control and for processing purposes. These companies have maintained well-equipped laboratories and have been able to establish a sound starting point for further technical and economic considerations. However, some of the smaller companies and independent operators have been without appropriate laboratory facilities and, not realizing the necessity for this work, have proceeded in a great many instances on ventures which later proved unprofitable.

This article presents the results of complete evaluations of several different petroleum products and shows that such work is within the reach of those companies which do not have elaborate laboratories. Two natural gasolines, a distillate, and a crude oil were the products studied.

The two natural gasolines were evaluated to determine their potentialities as sources of base stocks for the manufacture of aviation motor fuel. It was found that one of them contained appreciable quantities of a good base material, while the other was unsuitable for this purpose. This difference illustrates the danger inherent in failing to get accurate information as to the character of each stock it is desired to process. Thus, from a study of the results of the first evaluation it might have been erroneously concluded that a suitable quality aviation fuel can be made from any natural gasoline by the method used.

In the study of the distillate, it is shown how a raw gas can be evaluated in terms of its content of recoverable liquid and how the yields and characteristics of the gasoline, kerosene, and gas oil contained in this liquid can be determined.

A detailed crude evaluation is given to illustrate the kind of information a refiner should have before buying a crude to process. The crude was separated into its component gasoline, kerosene, gas oil, and fuel oil and the yields and inspections of the various products determined.

Obviously, the reliability of any analytical work depends to a large extent on the care with which the sample is taken and on the freedom of the sample from contamination and leakage in transportation. For this reason, tested pressure containers of suitable size and strength have been used for taking and transporting all samples.

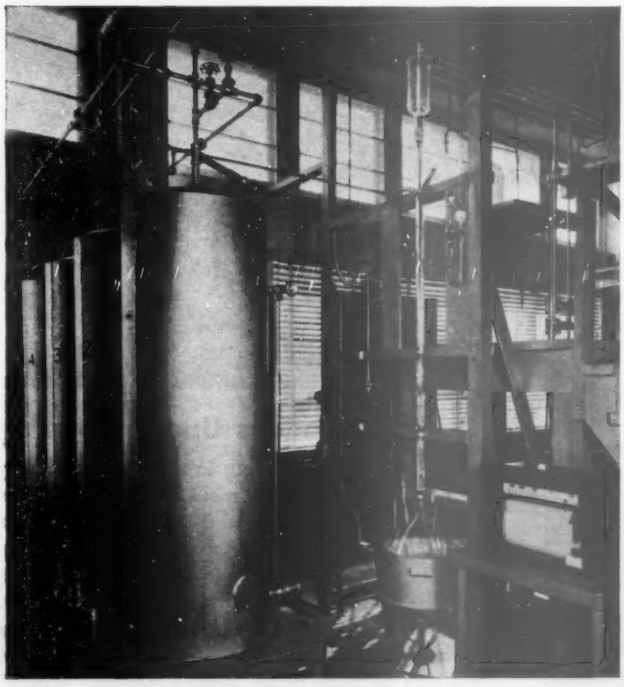


Fig. 1—General view of stabilizer equipment

Evaluation

For many years the principal use of natural gasoline in the oil industry has been to raise the volatility of motor fuel. Lately, with the increased demand for high-octane aviation gasolines, many plants in the Southwest are considering the manufacture of aviation base stocks as an outlet for their excess production. Two natural gasolines have been evaluated as sources of such stocks, and the results are presented in this article.

The first natural gasoline studied was a 26-lb. vapor-pressure material from the East Texas field. In the processing of this gasoline, the initial step was to completely debutanize it and determine the yield and characteristics of the debutanized liquid. This operation was carried out in the glass stabilizer shown in Fig. 1.

Table 1 gives the yields of butane and debutanized bottoms realized in this operation, together with inspections of these products. Although it was not feasible to weigh the charge stock, because of its high butane content, the total volume of the products recovered checked the volume of the sample container, showing that no appreciable loss was encountered.

TABLE 1—EVALUATION OF 26-LB. EAST TEXAS NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Debutanization Operation

Yields based on 26-lb. natural gasoline

	Vol. %	Wt. %
Input:		
26-lb. gasoline	100.0	100.0
Output:		
Butane	33.6	30.6
Debutanized bottoms	66.4	69.4
Total	100.0	100.0

Inspections of products

Butane:
Gaseous specific gravity = 1.985 (air = 1.000)

Debutanized bottoms:	
Specific gravity at 60° F.	0.6631
Gravity, °A.P.I. at 60° F.	81.9
A.S.T.M. distillation:	
I.B.P., °F.	95
5 per cent	103
10 per cent	106
20 per cent	109
30 per cent	113
40 per cent	117
50 per cent	123
60 per cent	129
70 per cent	141
80 per cent	161
90 per cent	198
95 per cent	234
E.P.	300
Per cent recovery	97.0
Per cent residue	0.6
Per cent loss	2.4
Reid vapor pressure, lb./sq. in.	13.2
Octane, C.F.R.-M: (clear)	71.6

While there are a number of ways in which aviation motor fuel meeting the U. S. Army and Navy specifications* can be made from natural gasoline, it was decided to use a relatively simple method. Also, it was decided to restrict the work to the production of the 91-octane grade* with the thought that this would simplify the study and still give significant results. The procedure consisted of dependentanization of the butane-free bottoms, since this material had too high a vapor pressure and was too light to meet the aviation distillation specifications, and then fortification of the dependentanized material (with isopentane) to meet the requirement of 7-lb. Reid vapor pres-

*These specifications have been approved by joint action of the War and Navy departments for four grades of aviation gasoline (65, 73, 91, and 100 octane numbers) and will be put into effect early in 1941. Among the specifications are:

Octane number, C.F.R. aviation knock-test method (min.)	65	73	91	100
TEL content, cc./gal. (max.)	..	1.0	4.0	3.0
Reid vapor pressure, lb./sq. in. (max.)	7.0	7.0	7.0	7.0
Distillation:				
At 10% evap., max. temp., °F.	167	167	167	167
At 50% evap., max. temp., °F.	221	221	212	212
At 90% evap., max. temp., °F.	302	302	275	275
10% evap. + 50% evap., min., °F.	307	307	307	307
Residue, % (max.)	1.5	1.5	1.5	1.5
Loss, % (max.)	1.5	1.5	1.5	1.5
Sulfur, wt. % (max.)	0.05	0.05	0.05	0.05

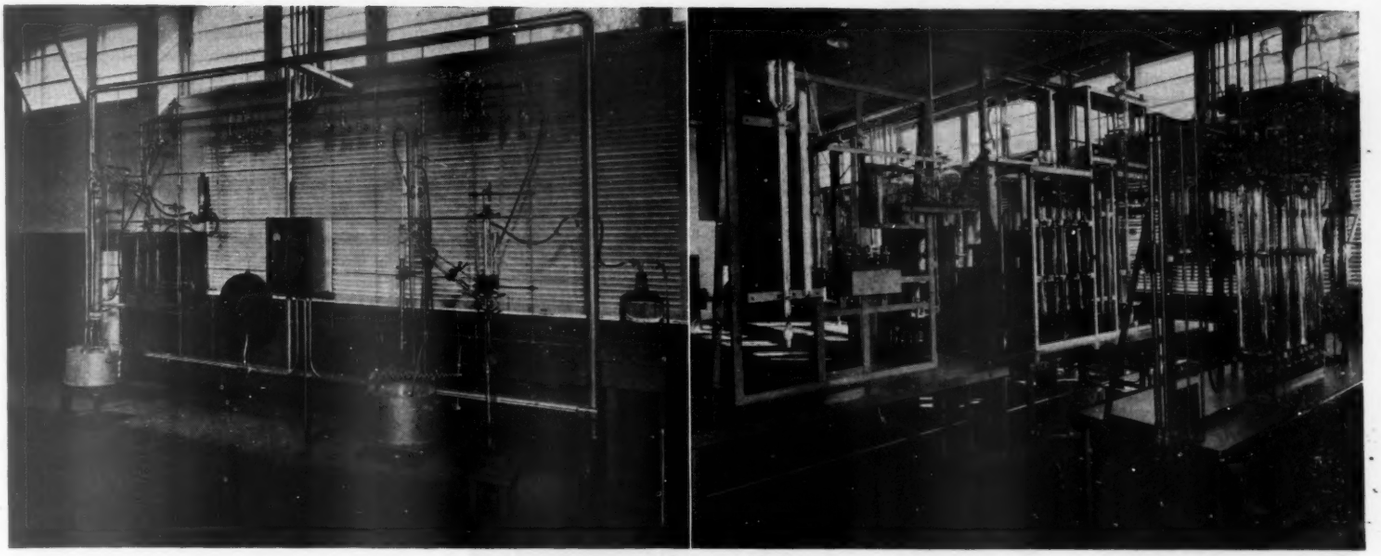


Fig. 2 (left)—True boiling-point distillation apparatus. At right is the atmospheric-pressure apparatus, while at left is the vacuum unit. Fig. 3 (right)—Gas-analysis apparatus

sure. Isopentane was used as the blending agent since in this way the clear octane number of the blend was made higher than if a mixture of normal and isopentane had been used. (Isopentane's octane rating is 90-92, while that of normal pentane is about 60.) Though other blending agents such as alkylate, isooctane, neohexane, or any combination of these could have been used, they are not contained in the charge stock, as is the isopentane, and in addition to being less readily available would be more expensive. At any rate, it is felt that the method used has the advantage of simplicity and gives results that are indicative of the ease or difficulty with which aviation gasoline can be made from the stock processed.

TABLE 2—EVALUATION OF 26-LB EAST TEXAS NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Depentanization Operation

Yields Based on Debutanized Bottoms

	Vol. %	Wt. %
Input:		
Debutanized bottoms	100.0	100.0
Output:		
Isopentane	25.9	24.2
Normal pentane	31.0	29.8
Depentanized bottoms	43.1	46.0
Total	100.0	100.0
Weight balance, per cent		99.9

Inspections

	Total pentanes	Depentanized bottoms
Specific gravity at 60° F.	0.6303	0.7064
Gravity, °A.P.I. at 60° F.	93.0	68.8
A.S.T.M. distillation:		
I.B.P., °F.	84	134
5 per cent	87	149
10 per cent	90	153
20 per cent	93	157
30 per cent	95	162
40 per cent	97	167
50 per cent	99	172
60 per cent	102	178
70 per cent	103	186
80 per cent	104	200
90 per cent	108	226
95 per cent	112	256
E.P.	...	332
Per cent recovery	96.0	99.0
Per cent residue	0.0	1.0
Per cent loss	4.0	0.0
Reid vapor pressure, lb./sq. in.	17.5	5.2
Octane, C.F.R.-M. (clear)	74.5	67.9

As pointed out in the preceding paragraph, the debutanized material had too high a vapor pressure and was too light to meet the aviation distillation specifications, and had to be dependantanized. This was done on the true boiling point still shown in Fig. 2. On this still there is a means for varying the reflux ratio, thus permitting control of the efficiency of the fractionation. To insure that no pentane would be lost, a supercooled trap was maintained at 0° F. to condense and return to the product receiver any pentane that might have evaporated. Then, the pentanes were analyzed in the Podbielniak column, shown in the right of Fig. 3, to determine the relative amounts of the iso and normal compounds. Table 2 gives the yields and inspections of the products from the dependantanization operation.

The next step was the blending of the dependantanized liquid with isopentane in an attempt to produce a 7-lb. vapor-pressure aviation motor fuel meeting the Army-Navy specifications. Data for the blending operation, together with a recapitulation of yields for the debutanization and dependantanization steps are presented in Table 3.

Since the maximum amount of tetraethyl lead allowed by these specifications is 4.0 cc. per gal. (for the 91-octane grade), it was necessary to plot lead response of the gasoline blend to estimate the octane number for this concentration of TEL fluid. This plot, shown as Fig. 4, has been made on the ethyl blending chart of Hebl, Rendel, and Garton.[1] (The coordinates have been set up in such a manner that lead response plots as a straight line if the experimental determinations are completely accurate.) Reading from Fig. 4 at 4.0 cc. of tetraethyl lead per gal., it is seen that the C.F.R.-M. octane

[1]The Oil and Gas Journal, Sept. 8, 1938.

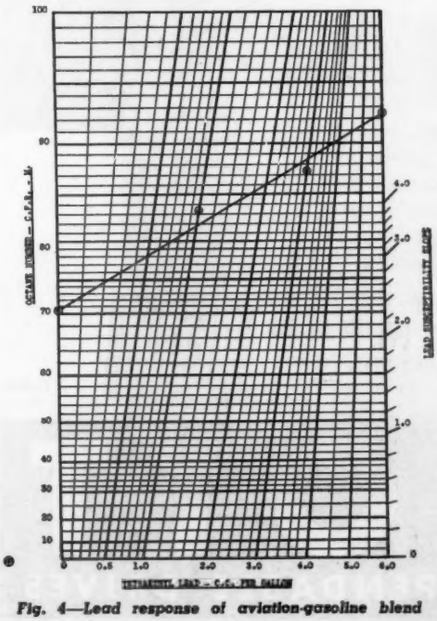


Fig. 4—Lead response of aviation-gasoline blend

TABLE 3—EVALUATION OF 26-LB EAST TEXAS NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Blending Operation and Recapitulation of Yields

Blending Operation

	Vol. %	Vol. % (based on nat. gaso.)
Isopentane (commercial)	10.7	3.4
Depentanized bottoms	89.3	28.6
Total	100.0	32.0

Recapitulation of Yields Based on 26-Lb. Natural Gasoline

	Vol. %	Wt. %
Butanes	33.6	30.6
Normal pentane	17.2	16.8
Isopentane	20.6	20.7
Depentanized bottoms	28.6	31.9
Total	100.0	100.0

Inspections

	Blended aviation gasoline	Debutanized bottoms	Depentanized bottoms
Sp. gr. at 60° F.	0.6964	0.6631	0.7064
Grav., °A.P.I. at 60° F.	71.7	81.9	68.8
A.S.T.M. distillation:			
I.B.P., °F.	122	95	134
5 per cent	137	103	149
10 per cent	142	106	153
20 per cent	146	109	157
30 per cent	151	113	162
40 per cent	158	117	167
50 per cent	168	123	172
60 per cent	174	129	178
70 per cent	183	141	186
80 per cent	197	161	200
90 per cent	227	198	226
95 per cent	258	234	256
E.P.	325	300	332
Per cent recovery	98.0	97.0	99.0
Per cent residue	1.0	0.6	1.0
Per cent loss	1.0	2.4	0.0
Per cent rec. at 167° F.	51.5	82.5	38.0
Per cent rec. at 212° F.	86.0	92.5	85.5
R.v.p., lb./sq. in.	7.1	13.2	5.2
Gum (A.S.T.M.), mg. 100 cc.	2	...	...
Acid heat (A.S.T.M.), °F.	3	...	...
Sulfur, wt. per cent	0.002	...	...
Color, Saybolt	+30	...	...
Doctor test	Neg.	...	...
Corrosion, copper strip at 212° F.	Pass	...	...
Octane, C.F.R.-M. (clear)	70.4	71.6	67.9
Octane, C.F.R.-M. (1 cc. T.E.L.)	83.2	...	...
Octane, C.F.R.-M. (3 cc. T.E.L.)	87.4	...	...
Octane, C.F.R.-M. (6 cc. T.E.L.)	92.4	...	...
Octane, C.F.R.-M. (4 cc. T.E.L.), est.	90	...	...
Octane, C.F.R.-A.F.D. (4 cc. T.E.L.), est.	91-92	...	...

number of the blend is 90, which is equivalent to about 91-92 by the C.F.R. aviation knock-test method.

Since the blended gasoline had a sufficiently high antiknock rating to meet the requirement of 91-octane number (C.F.R.-A.F.D. method) and since the distillation range and other tests met the Army-Navy specifications, it can safely be said that East Texas natural gasoline furnishes a promising source of good aviation-gasoline base stocks. Thus, by a relatively simple procedure it has been found possible to make 32.0 per cent of 91-octane aviation motor fuel from the natural gasoline. At the same time, 17.2 per cent isopentane was produced above that amount required to make the aircraft fuel.

Another product, from a different field, has also been investigated as a potential source of aviation gasoline. This material was an 18-lb. vapor-pressure natural, for which inspection data are given in Table 4. The procedure followed was the same as that outlined in the preceding paragraphs for the evaluation of the East Texas stock. Data for the debutanization, dependanization, and blending operations are shown as Tables 5, 6, and 7.

The blended gasoline made from the 18-lb. material did not have a high enough octane rating to meet the Army-Navy specification of 91. Thus, it is estimated that the antiknock rating would be only 87 by the A.S.T.M. method (about 88 by the aviation knock-test method) when the blend contains 4.0 cc. of tetraethyl lead per gal. Even though it should be possible to produce a high-test aircraft motor fuel from the 18-lb. vapor-pressure charge, large quantities of such expensive blending stocks as neohexane, isooctane, or alkylate would be required, and such a procedure probably could not be justified on an economic basis. Indications are that the octane number of the base stock must be in the neighborhood of 70 before it is practical to make aviation gasoline from it.

In spite of the fact that the results of this latter

TABLE 4—EVALUATION OF 18-LB. NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Inspections of Natural Gasoline

Specific gravity at 60° F.	0.6643
Gravity, °A.P.I. at 60° F.	81.5
A.S.T.M. distillation:	
I.B.P., °F.	85
5 per cent	90
10 per cent	96
20 per cent	105
30 per cent	114
40 per cent	127
50 per cent	140
60 per cent	156
70 per cent	176
80 per cent	200
90 per cent	238
95 per cent	276
E.P.	291
Per cent recovery	97.0
Per cent residue	0.6
Per cent loss	2.4
Reid vapor pressure, lb./sq. in.	17.5
Octane, C.F.R.-M. (clear)	66.9

TABLE 5—EVALUATION OF 18-LB. NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Debutanization Operation

Yields Based on 18-Lb. Natural Gasoline

	Vol.%	Wt. %
Input:		
18-lb. gasoline	100.0	100.0
Output:		
Butane	16.6	14.6
Debutanized bottoms	83.4	85.4
Total	100.0	100.0

Inspections of Products

Butane:	
Gaseous specific gravity = 1.998 (air = 1.000)	
Debutanized bottoms:	
Specific gravity at 60° F.	0.6787
Gravity, °A.P.I. at 60° F.	77.0
A.S.T.M. distillation:	
I.B.P., °F.	100
5 per cent	118
10 per cent	122
20 per cent	128
30 per cent	134
40 per cent	142
50 per cent	153
60 per cent	165
70 per cent	182
80 per cent	205
90 per cent	236
95 per cent	260
E.P.	295
Per cent recovery	98.0
Per cent residue	0.5
Per cent loss	1.5
Reid vapor pressure, lb./sq. in.	8.9
Octane, C.F.R.-M. (clear)	60.4

TABLE 6—EVALUATION OF 18-LB. NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Dependanization Operation

Yields and Material Balance

	Vol. %	Wt. %
Input:		
Debutanized bottoms	100.0	100.0
Output:		
Isopentane	14.5	13.2
Normal pentane	20.6	19.6
Dependanized bottoms	64.9	67.2
Total	100.0	100.0
Weight balance, per cent		99.4

Inspections

	Total pentanes	Dependanized bottoms
Specific gravity at 60° F.	0.6306	0.7050
Gravity, °A.P.I. at 60° F.	92.9	69.2
A.S.T.M. distillation:		
I.B.P., °F.	88	140
5 per cent	90	162
10 per cent	91	166
20 per cent	92	169
30 per cent	93	173
40 per cent	94	178
50 per cent	96	186
60 per cent	98	194
70 per cent	100	209
80 per cent	102	225
90 per cent	106	251
95 per cent	109	277
E.P.	...	300
Per cent recovery	98.0	97.0
Per cent residue	0.2	0.6
Per cent loss	1.8	2.4
Reid vapor pressure, lb./sq. in.	17.2	4.2
Octane, C.F.R.-M (clear)	73.2	53.5

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program were largely of a negative nature, they are important in that they illustrate the necessity for accurately evaluating each stock it is desired to process. That is, it might have been erroneously concluded from the study of the 26-lb. East Texas material that a suitable quality aviation-gasoline base stock can be made from any casinghead.

Distillate Evaluation

During the past few years distillate production in the Gulf Coast area has steadily increased until it has reached an estimated figure of 40,000 bbl. per day. While there have been many articles published and a great deal of interest displayed in distillate production and the associated recycling projects, it is surprising how little completely reliable data are available on the analysis of raw gas from the wells and the characteristics of the recovered distillate. Usually, it is possible on new distillate projects to secure Podbielniak analyses of the raw gas, but in most cases very little is known about the characteristics of the distillate. Such an accurate determination of the raw-gas analysis and a detailed evaluation of the recovered distillate are relatively easy to obtain and because it is basic in any economic evaluation of the project, they should be secured during the initial stages of the development.

One of the satisfactory methods of obtaining an accurate analysis of the raw well gas is to flow the stream into a high-pressure separator, collecting and analyzing samples of the separator vapor and liquid. Fig. 5 shows diagrammatically a sketch of this type of operation. By compositing these two analyses according to a material balance on the separator, the analysis of the raw gas is obtained. This method of procedure naturally requires the metering of both the dry gas and the liquid.

It is possible in most instances to take a representative sample of the raw gas directly from the well head before the choke. However, such a sample is very difficult to handle in the laboratory, and this method will not give enough distillate for a complete evaluation unless the sample is continually drawn into a small separator and the gas and liquid measured and handled as described above. The latter method is generally used in connection with portable testing units.

Samples of raw well gas should never be taken from the line between the choke and the separator

TABLE 7—EVALUATION OF 18-LB. NATURAL GASOLINE FOR AVIATION-GASOLINE BASE STOCK

Blending Operation and Recapitulation of Yields

Blending Operation

	Vol. %	Vol. % (based on nat. gaso.)
Isopentane (commercial)	17.5	11.5
Depentanized bottoms	82.5	54.1
Total	100.0	65.6

Recapitulation of Yields Based on 18-Lb. Natural Gasoline

	Vol. %	Wt. %
Butanes	16.6	14.6
Isopentane	12.1	11.3
Normal pentane	17.2	16.7
Depentanized bottoms	54.1	57.4
Total	100.0	100.0

Inspections

	Blended aviation gasoline	Debutanized bottoms	Depentanized bottoms
Sp. gr. at 60° F.	0.6919	0.6787	0.7050
Grav., °A.P.I. at 60° F.	73.0	77.0	69.2
A.S.T.M. distillation:			
I.B.P., °F.	112	100	140
5 per cent	134	118	162
10 per cent	139	122	166
20 per cent	146	128	169
30 per cent	154	134	173
40 per cent	164	142	178
50 per cent	174	153	186
60 per cent	186	165	194
70 per cent	199	182	209
80 per cent	218	205	225
90 per cent	247	236	261
95 per cent	274	260	277
E.P.	304	295	300
Per cent recovery	97.5	98.0	97.0
Per cent residue	1.0	0.5	0.6
Per cent loss	1.5	1.5	2.4
Per cent rec. at 167° F.	42.9	61.5	12.0
Per cent rec. at 212° F.	78.5	82.5	73.0
R.v.p., lb./sq. in.	7.0	8.9	4.2
Gum (A.S.T.M.), mg./100 cc.	3	...	...
Acid heat (A.S.T.M.), °F.	4	...	...
Sulfur, wt. per cent	0.004	...	...
Color, Saybolt	+30	...	...
Doctor test	Neg.	...	...
Corrosion, copper strip at 212° F.	Pass	...	...
Octane, C.F.R.-M. (clear)	60.3	60.4	53.5
Octane, C.F.R.-M. (1 cc. T.E.L.)	75.7	...	...
Octane, C.F.R.-M. (3 cc. T.E.L.)	83.6	...	...
Octane, C.F.R.-M. (4 cc. T.E.L.), est.	87	...	...
Octane, C.F.R.-A.F.D. (4 cc. T.E.L.), est.	88	...	...

TABLE 8—EVALUATION OF DISTILLATE

Summary of Separator Operation

Operating Conditions

Separator pressure = 485 lb. per sq. in. gage
Separator temperature = 76° F.

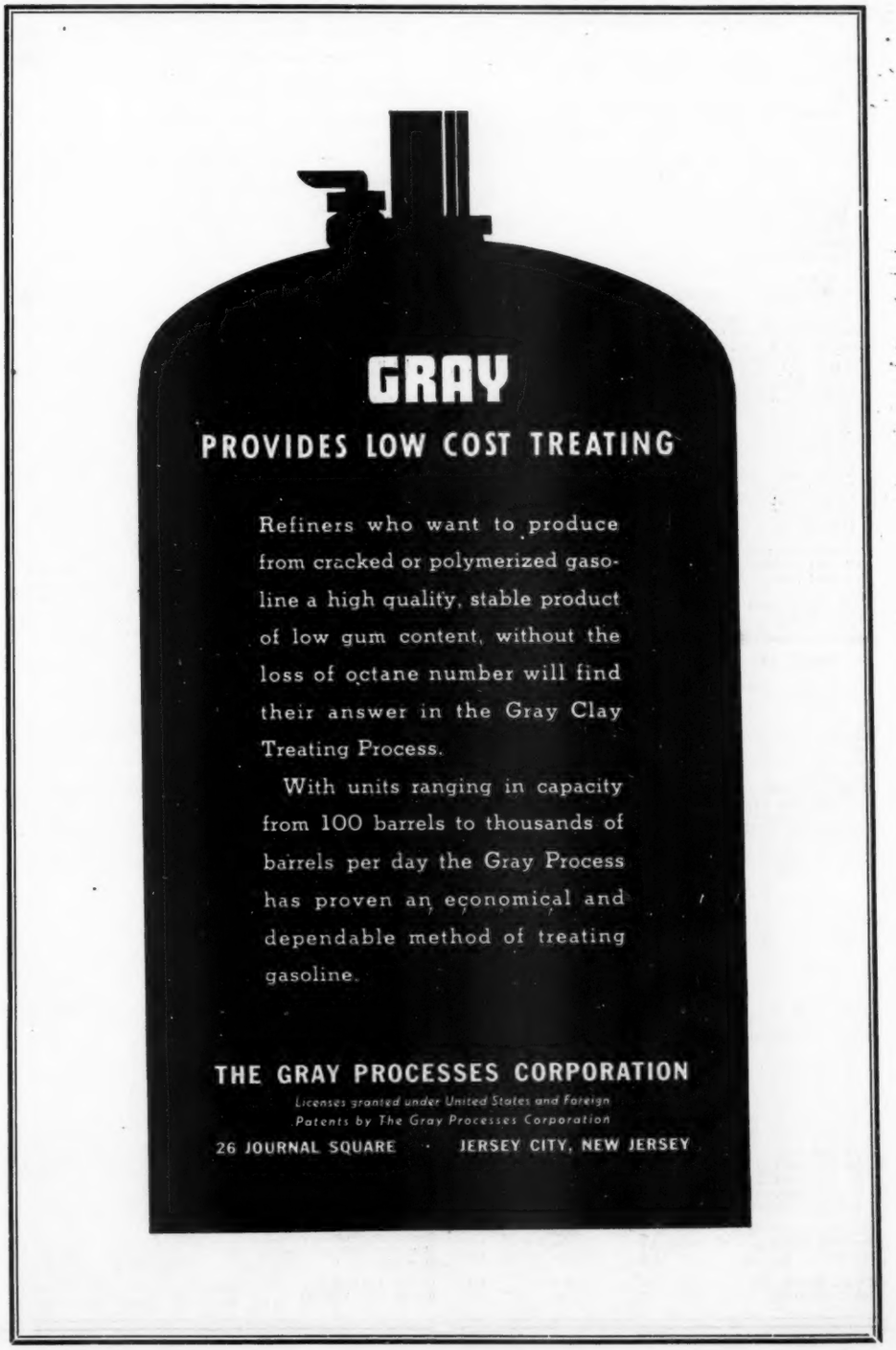
Quantities

Separator dry gas = 475,000 stand. cu. ft. per hour
Separator liquid = 470 gal. per hour

Podbielniak Analyses
(Mol. per cent)

	Separator dry gas	Separator liquid	Raw well gas
Methane	94.53	13.12	92.88
Ethane	3.18	2.19	3.16
Propane	1.24	2.70	1.27
Isobutane	0.32	1.52	0.34
Normal butane	0.33	1.96	0.37
Isopentane	0.08	1.14	0.10
Normal pentane	0.09	1.56	0.12
Hexane plus heavier	0.23	75.81	1.76
Total	100.00	100.00	100.00

Specific gravity of hexane plus heavier = 0.7809
Molecular weight of hexane plus heavier = 138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as the throttling effect of the choke changes the gas from a substantially homogeneous mixture into a liquid-vapor mixture. Sampling such a system is extremely difficult, if not impossible.

Here, it is well to mention that there are two general types of distillate recovery plants; viz., those employing high-pressure absorption and those in which the condensate is recovered in a high-pressure separator. Since the latter method was used to obtain the liquid for testing in the experiment reported herein, this kind of operation is considered first. Usually, it is practical, when using separators, to get 85 to 90 per cent recovery of liquid as compared with almost quantitative recovery in efficient absorber systems.

TABLE 9—EVALUATION OF DISTILLATE
Debutanization of Separator Liquid

Yields Based on Separator Liquid

Input:	Wt. %	Vol. %	Gal./1,000 st. cu. ft. of raw well gas
Separator liquid	100.0	100.0	....
Output:			
Gas	5.3	9.9	....
Debutanized distillate	94.7	90.1	0.872
Total	100.0	100.0	0.872

Inspection of Products

Gas	Mol. %
Methane	61.03
Ethane	10.20
Propane	12.59
Isobutane	7.07
Normal butane	9.11
Total	100.00

Gaseous specific gravity = 0.960 (air = 1.000)

Debutanized Distillate

Specific gravity at 60° F.	0.7788
Gravity, °A.P.I. at 60° F.	50.2
A.S.T.M. distillation:	
I.B.P., °F.	120
5 per cent	180
10 per cent	209
20 per cent	234
30 per cent	259
40 per cent	286
50 per cent	317
60 per cent	360
70 per cent	418
80 per cent	472
90 per cent	541
95 per cent	582
E.P.	603
Per cent recovery	97.0
Per cent residue	2.0
Per cent loss	1.0
Reid vapor pressure, lb./sq. in.	2.7
Color, Saybolt	+4

TABLE 10—FORTIFICATION OF DISTILLATE

Analysis of Separator Liquid

	Mol. %	Gal./1,000 st. cu. ft. of raw well gas
Methane	13.12	....
Ethane	2.19	....
Propane	2.70	....
Isobutane	1.52	0.010
Normal butane	1.96	0.012
Pentane plus heavier	78.51	0.872
Total	100.00	0.894

Analysis of Distillate Yields

	Debutanized distillate	10-lb. R.v.p. distillate	14-lb. R.v.p. distillate
Debutanized distillate (gal./M.)	0.872	0.872	0.872
Butane (gal./M.)	None	0.088	0.174
Total (gal./M.)	0.872	0.960	1.046
Inspections			
Sp. gr. at 60° F.	0.7788	0.7645	0.7551
Grav., °A.P.I. at 60° F.	50.2	53.6	55.9
A.S.T.M. distillation:			
I.B.P., °F.	120	88	82
5 per cent	180	108	104
10 per cent	209	134	124
20 per cent	234	198	198
30 per cent	259	232	232
40 per cent	286	262	263
50 per cent	317	297	296
60 per cent	360	338	346
70 per cent	418	392	398
80 per cent	472	452	467
90 per cent	531	522	532
95 per cent	582	580	603
E.P.	603	615	616
Per cent recovery	97.0	97.0	94.5
Per cent residue	2.0	1.0	1.0
Per cent loss	1.0	2.0	4.5
R.v.p., lb./sq. in.	2.7	10.0	14.0
Color, Saybolt	+4	+6	+8

TABLE 11—EVALUATION OF DISTILLATE
Summary of Yields From Distillation—Fortification of Gasolines

Yields Based on Debutanized Distillate

	300°-E.P. gasoline		400°-E.P. gasoline	
Volume per cent yields:	Butane free	7-lb. R.v.p.	Butane free	10-lb. R.v.p.
Butane-free Gasoline A (300° end point)	49.4	49.4	....	....
Normal butane	....	3.0	....	....
7-lb. R.v.p. Gasoline A	....	52.4	....	....
Butane-free Gasoline B (400° end point)	....	....	69.7	69.7
Normal butane	....	....	....	8.6
10-lb. R.v.p. Gasoline B	....	....	....	78.3
Kerosene A (300° to 500°)	34.9	34.9	....	....
Kerosene B (400° to 500°)	....	....	14.6	14.6
Bottoms	15.7	15.7	15.7	15.7
Total	100.0	103.0	100.0	108.6
Weight per cent yields:				
Butane-free Gasoline A (300° end point)	47.1	47.1	....	....
Normal butane	....	2.4	....	....
7-lb. R.v.p. Gasoline A	....	49.5	....	....
Butane-free Gasoline B (400° end point)	....	....	67.9	67.9
10 Normal butane	....	....	....	6.8
10-lb. R.v.p. Gasoline B	....	....	....	74.7
Kerosene A (300° to 500°)	36.1	36.1	....	....
Kerosene B (400° to 500°)	....	....	15.3	15.3
Bottoms	16.8	16.8	16.8	16.8
Total	100.0	102.4	100.0	106.8
Gasoline Inspections				
Specific gravity at 60° F.	0.7455	0.7320	0.7591	0.7405
Gravity, °A.P.I. at 60° F.	58.3	61.8	54.9	59.6
A.S.T.M. distillation:				
I.B.P., °F.	132	110	136	100
5 per cent	162	142	186	122
10 per cent	183	160	200	140
20 per cent	195	185	218	184
30 per cent	205	202	233	197
40 per cent	215	214	248	237
50 per cent	224	224	264	254
60 per cent	233	233	284	276
70 per cent	244	244	304	300
80 per cent	257	258	330	326
90 per cent	273	275	360	358
95 per cent	286	292	381	381
E.P.	300	311	400	398
Per cent recovery	98.0	97.5	98.0	97.5
Per cent residue	1.0	0.8	1.0	0.9
Per cent loss	1.0	1.7	1.0	1.6
Per cent recovery at 158° F.	3.0	8.5	1.5	15.0
Per cent recovery at 183° F.	10.0	19.5	4.5	19.5
Per cent recovery at 212° F.	37.5	39.0	16.5	32.0
Per cent recovery at 221° F.	47.0	48.0	22.0	35.5
Per cent recovery at 284° F.	94.0	92.0	60.0	63.5
Per cent recovery at 392° F.	....	....	97.0	96.5
Reid vapor pressure, lb./sq. in	3.7	7.0	2.7	10.0
Color, Saybolt	+30	+30	+30	+30
Gum, mg./100 cc (A.S.T.M.)	4	....	5	....
Sulfur, weight per cent	0.003	....	0.005	....
Doctor test	Negative		Negative	
Corrosion, copper strip at 212° F.	Pass	Pass	Pass	Pass
Octane, C.F.R.-M. (clear)	63.4	65.4	53.8	58.8
Octane, C.F.R.-M. (1 cc. TEL)	....	75.0	....	67.3
Octane, C.F.R.-M. (3 cc. TEL)	....	84.0	....	78.1
Kerosene Inspections				
Specific gravity at 60° F.	0.8058		0.8208	
Gravity, °A.P.I. at 60° F.	44.1		40.9	
A.S.T.M. distillation:				
I.B.P., °F.	340		430	
5 per cent	350		440	
10 per cent	356		442	
20 per cent	365		444	
30 per cent	375		447	
40 per cent	383		451	
50 per cent	396		455	
60 per cent	409		458	
70 per cent	425		463	
80 per cent	443		470	
90 per cent	462		479	
95 per cent	474		488	
E.P.	501		500	
Per cent recovery	98.0		98.0	
Per cent residue	1.0		1.0	
Per cent loss	1.0		1.0	
Color, Saybolt	+14		+10	
Doctor test	Neg.		Neg.	
Corrosion, copper strip at 212° F.	Pass		Pass	
Flash, °F. (Tag. C.C.)	126		187	
Bottoms Inspections				
Specific gravity at 60° F.	0.8393		0.8393	
Gravity, °A.P.I. at 60° F.	37.1		37.1	
A.S.T.M. distillation:				
I.B.P., °F.	517		517	
5 per cent	536		536	
10 per cent	539		539	
20 per cent	545		545	
30 per cent	549		549	
40 per cent	554		554	
50 per cent	562		562	
60 per cent	573		573	
70 per cent	585		585	
80 per cent	605		605	
90 per cent	644		644	
95 per cent	674		674	
E.P.	684		684	
Per cent recovery	98.5		98.5	
Per cent residue	1.0		1.0	
Per cent loss	0.5		0.5	
Color, A.S.T.M.	4½ Dil		4½ Dil	
Flash, °F. (P.M.C.C.)	270		270	

To illustrate the information which should be available in a complete distillate evaluation, a specific workup is given with explanations of the various operations and results.

Table 8 gives the temperature and pressure conditions on the separator at the time the test was run, the analyses and quantities of dry gas and liquid, and the composition of the raw well gas, this last item being calculated by compositing the dry gas and liquid analyses according to the separator material balance. In the accurate Podbielniak analysis of a dry gas such as shown in Table 8, it is necessary to take a very large sample in order to be able to determine the presence of the small amounts of heavy hydrocarbons. As an alternative to taking a large sample, the heavy components can be concentrated by condensing them at a low temperature and metering and analyzing both the condensate and the uncondensed gas. Regardless of how this is done, it is important to obtain the correct composition of the dry gas, and almost any trouble is justified to get an accurate analysis.

In order to have enough of the pentane and heavier fractions for the evaluation work, 4 gal. of the separator liquid were charged to the laboratory glass stabilizer (Fig. 1), wherein the liquid was debutanized. The overhead gas and debutanized liquid resulting from the operation were measured and analyzed. Knowing the quantity and analyses of these two streams, the analysis of the separator liquid was readily calculated. It should be noted that determining the separator liquid composition in this manner is more accurate than charging a small amount of the liquid directly into a Podbielniak apparatus for analysis, the reason being that a considerably larger amount of gas can be run in the Podbielniak apparatus when the stabilization operation is initially carried out on the separator liquid. The results of the stabilization operation are tabulated in Table 9.

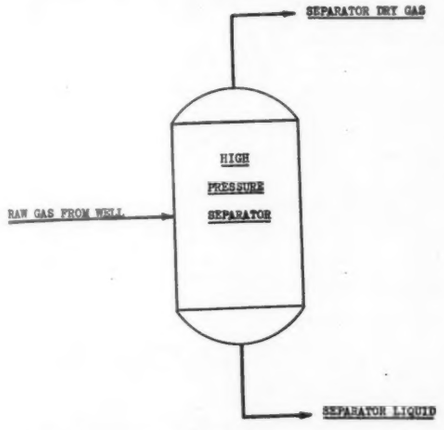


Fig. 5—Diagramatic sketch of separator method of sampling

Table 10 is a summary of data obtained for the fortification of the distillate with enough butane to make 10-lb. and 14-lb. R.v.p. The yield and inspections of the butane-free distillate are compared with those of the fortified products. This operation was carried out in the glass stabilizer shown in Fig. 1, butane being added slowly while any dissolved gas was expelled by boiling gently and refluxing at the same time.

The next step in the evaluation of the distillate was the determination of the yields and characteristics of 300° and 400° end-point gasolines, the corresponding 300°-500° and 400°-500° kerosenes, and the gas-oil bottoms. The debutanized material was carefully fractionated in the true-boiling-point still shown in Fig. 2, the overhead being drawn off in separate cuts, which were then blended together to make the products mentioned. Table 11 give the data obtained.

The 300° and 400° end-point gasolines were fortified with butane to, respectively, 7-lb. and 10-lb. R.v.p. Quantities of butane added and the inspections of the fortified products are also given in Table 11.

Fig. 6 shows the lead response of the fortified gasolines plotted on the Hebl, Rendel, and Garton chart.[1] The indications are that the 300° end-point material would not make a good high-octane aviation base stock because of its low antiknock rating. Possibly, a suitable quality base stock could be produced by cutting at a lower end point.

Since the conventional way of expressing yields, in an evaluation such as this, is based back on the raw well gas, the gallons of the various debutanized and fortified distillates and gasolines per 1,000 cu. ft. of well gas are shown in Table 12, together with the corresponding inspections.

As brought out in the foregoing discussion, there are two general means employed for the recovery of distillate in a well gas. These are high-pressure absorption and high-pressure separation, in which the dry gas is taken overhead in a separator tower and the liquid drawn off the bottom. The latter method, which was used to obtain the distillate for the experimental program just discussed, results in considerable loss of light ends in the separator dry gas while in the former type of oper-

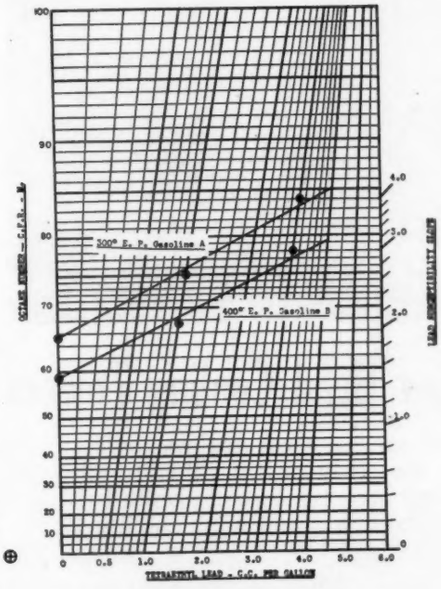


Fig. 6—Lead response of fortified gasoline

TABLE 13—EVALUATION OF DISTILLATE

Comparison of Methods of Distillate Recovery

Recapitulation of Yields Based on Well Gas

Method of distillate recovery—	High-pressure separator	High-pressure absorber
Volume per cent of distillate recovered	85.5	100.0
Distillate		
(a) Butane free:		
Yield, gal. per M.c.f.	0.872	1.022
Specific gravity at 60° F.	0.7788	0.7616
Gravity, °A.P.I. at 60° F.	50.2	54.3
Reid vapor pressure, lb./sq. in.	2.7	4.3
(b) 10-lb. R.v.p.:		
Yield, gal. per M.c.f.	0.960	1.105
Specific gravity at 60° F.	0.7645	0.7483
Gravity, °A.P.I. at 60° F.	53.6	57.6
Reid vapor pressure, lb./sq. in.	10.0	10.0
(c) 14-lb. R.v.p.:		
Yield, gal. per M.c.f.	1.046	1.183
Specific gravity at 60° F.	0.7551	0.7401
Gravity, °A.P.I. at 60° F.	55.9	59.7
Reid vapor pressure, lb./sq. in.	14.0	14.0
300°-E.P. Gasoline A		
(a) Butane free:		
Yield, gal. per M.c.f.	0.431	0.576
Specific gravity at 60° F.	0.7455	0.7245
Gravity, °A.P.I. at 60° F.	58.3	63.8
Reid vapor pressure, lb./sq. in.	3.7	5.7
Octane number, C.F.R.-M. (clear)	63.4	65.6
(b) 7-lb. R.v.p.:		
Yield, gal. per M.c.f.	0.457	0.589
Specific gravity at 60° F.	0.7320	0.7230
Gravity, °A.P.I. at 60° F.	61.8	64.2
Reid vapor pressure, lb./sq. in.	7.0	7.0
Octane number, C.F.R.-M. (clear)	65.4	66.4
400°-E.P. Gasoline B		
(a) Butane free:		
Yield, gal. per M.c.f.	0.607	0.756
Specific gravity at 60° F.	0.7591	0.7389
Gravity, °A.P.I. at 60° F.	54.9	60.0
Reid vapor pressure, lb./sq. in.	2.7	4.6
Octane number, C.F.R.-M. (clear)	53.8	57.4
(b) 10-lb. R.v.p.:		
Yield, gal. per M.c.f.	0.682	0.824
Specific gravity at 60° F.	0.7405	0.7286
Gravity, °A.P.I. at 60° F.	59.6	62.7
Reid vapor pressure, lb./sq. in.	10.0	10.0
Octane number, C.F.R.-M. (clear)	58.8	60.8

TABLE 14—EVALUATION OF 37.6-GRAVITY EAST TEXAS CRUDE

Inspections of Crude

Specific gravity at 60° F.	0.8368
Gravity, °A.P.I. at 60° F.	37.6
A.S.T.M. distillation:	
I.B.P., °F.	100
5 per cent	240
10 per cent	271
20 per cent	344
30 per cent	426
40 per cent	507
50 per cent	568
60 per cent	656
67 per cent (cracked)	678
Color	Black
B.s. and w. by centrifuge, volume per cent	0.10
B.s. by extraction, weight per cent	0.19
Salt content, lb. per 1,000 bbl.	4.6

TABLE 12—EVALUATION OF DISTILLATE

Operation With Separator—Recapitulation of Yields Based on Well Gas

Raw-Well-Gas Analysis

	Mol. %	Wt. %	Gal./M. cu. ft.
Methane	92.88	77.22	....
Ethane	3.16	4.92	....
Propane	1.27	2.91	0.346
Isobutane	0.34	1.03	0.104
Normal butane	0.37	1.12	0.110
Pentane plus heavier	1.98	12.80	1.022
Total	100.0	100.00	1.582

Volume Per Cent of Distillate Recovered—85.5

Distillate

	Butane free	10-lb. R.v.p.	14-lb. R.v.p.
Yield, gal./1,000 stand. cu. ft.	0.872	0.960	1.046
Specific gravity at 60° F.	0.7788	0.7645	0.7551
Gravity, °A.P.I. at 60° F.	50.2	53.6	55.9
Reid vapor pressure, lb./sq. in.	2.7	10.0	14.0

Gasoline

	300° E.P.		400° E.P.	
	Butane free	7-lb. R.v.p.	Butane free	10-lb. R.v.p.
Yield, gal./1,000 stand. cu. ft.	0.431	0.457	0.607	0.682
Specific gravity at 60° F.	0.7455	0.7320	0.7591	0.7405
Gravity, °A.P.I. at 60° F.	58.3	61.8	54.9	59.6
Reid vapor pressure, lb./sq. in.	3.7	7.0	2.7	10.0
Octane number, C.F.R.-M. (clear)	63.4	65.4	53.8	58.8

ation almost quantitative recovery of the condensate can be effected. Since about 15 per cent of the pentane plus heavier material was lost in the separator dry gas, calculations have been made to ascertain the effect of this loss on the inspections of the laboratory products in order to compare results for the two methods of condensate recovery. Table 13 is a comparison of yields and product inspections for operation with a high-pressure separator and for operation with a high-pressure absorber. The addition of the light ends to the liquid improved both the yield and quality of the products. It was not possible to determine the influence of the added light material on the A.S.T.M. distillation.

At this time a number of pilot plants are in operation in the Southwest for the sampling of wells and accurate measuring of the gas. While most of these employ the separator principle, merely flashing the dry gas overhead, at least one known to the writers efficiently separates the gas and liquid by the use of high-pressure absorption.

Crude Evaluation

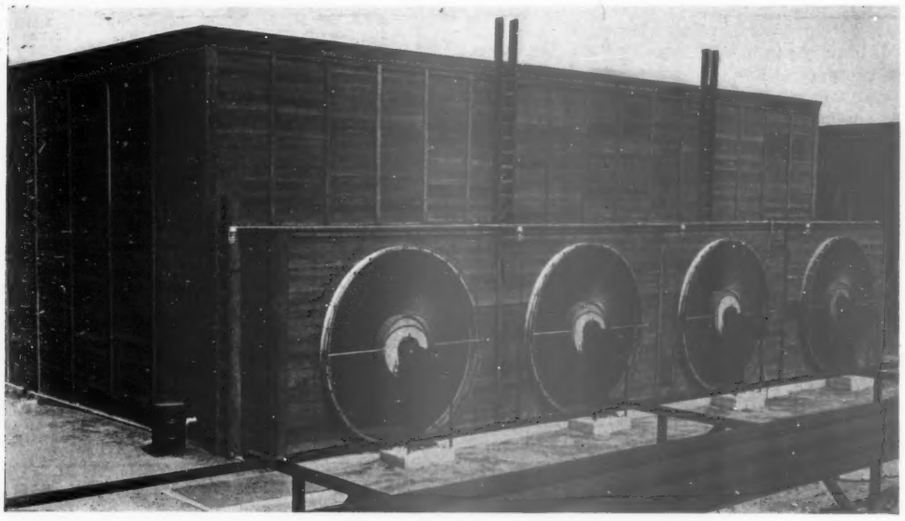
In the oil industry it is customary to post crude-oil prices as a function of gravity. However, gravity is not a very comprehensive measure of quality, and when a refiner is buying crude ne must know accurately the yields and characteristics of the various fractions in order to be able to balance out his operations. As an example of the kind of information that should be determined, the last section of this article is devoted to the presentation of the results of a detailed evaluation. The stock studied was a 37.6° A.P.I. East Texas crude, for which inspections are given in Table 14.

In this evaluation, the crude was carefully fractionated in the true boiling-point still, and the

TABLE 15—EVALUATION OF 37.6-GRAVITY EAST TEXAS CRUDE

Summary of Yields and Inspections of Products

	300°-E.P. gasoline	350°-E.P. gasoline	400°-E.P. gasoline
Yields (Volume per cent on crude)			
Gasoline A (300° E.P.)	24.5	....	....
Gasoline B (350° E.P.)	....	30.6	....
Gasoline C (400° E.P.)	....	....	35.4
Kerosene A (300° to 525°)	25.5	....	....
Kerosene B (350° to 525°)	....	19.4	....
Kerosene C (400° to 525°)	....	....	14.6
Gas oil (525° to 650°)	13.4	13.4	13.4
Fuel oil bottoms	35.5	35.5	35.5
Butane	1.1	1.1	1.1
Total	100.0	100.0	100.0
Gasoline Inspections			
Sp. gr. at 60° F.	0.7301	0.7440	0.7539
Gravity, °A.P.I. at 60° F.	62.3	58.7	56.2
A.S.T.M. distillation:			
I.B.P., °F.	118	118	126
5 per cent	149	158	165
10 per cent	161	175	192
20 per cent	180	198	206
30 per cent	198	215	225
40 per cent	209	232	246
50 per cent	220	243	261
60 per cent	231	260	283
70 per cent	242	276	312
80 per cent	255	296	336
90 per cent	274	319	365
95 per cent	287	334	394
E.P.	304	349	400
Per cent recovery	98.5	98.0	98.0
Per cent residue	1.0	1.0	1.0
Per cent loss	0.5	1.0	1.0
Per cent rec. at 158° F.	8.5	5.0	3.5
Per cent rec. at 183° F.	21.5	13.5	10.5
Per cent rec. at 212° F.	42.2	28.5	23.5
Per cent rec. at 221° F.	50.7	34.0	28.0
Per cent rec. at 284° F.	94.0	74.0	60.5
Per cent rec. at 392° F.	....	....	97.0
R.v.p., lb./sq. in.	5.2	4.5	4.0
Color, Saybolt	+30	+30	+30
Gum, mg./100 cc. (Atlantic copper dish)	2	2	4
Gum, mg./100 cc. (A.S.T.M. glass dish)	1	1	4
Sulfur, wt. per cent	0.003	0.005	0.009
Doctor test	Neg.	Neg.	Neg.
Corrosion, copper strip at 212° F.	Pass	Pass	Pass
Octane, C.F.R.-M. (clear)	67.0	61.0	58.0
Kerosene Inspections			
Sp. gr. at 60° F.	0.8208	0.8289	0.8358
Gravity, °A.P.I. at 60° F.	40.9	39.2	37.8
A.S.T.M. distillation:			
I.B.P., °F.	348	400	442
5 per cent	366	416	456
10 per cent	373	421	458
20 per cent	383	428	462
30 per cent	394	436	465
40 per cent	412	443	471
50 per cent	431	453	476
60 per cent	447	465	482
70 per cent	464	478	489
80 per cent	480	490	497
90 per cent	500	508	510
95 per cent	518	520	519
E.P.	526	532	535
Per cent recovery	98.5	98.5	98.5
Per cent residue	1.0	1.0	1.0
Per cent loss	0.5	0.5	0.5
Color, Saybolt	+20	+18	+17
Sulfur, wt. per cent	0.020	0.050	0.062
Doctor test	Neg.	Neg.	Neg.
Corrosion, copper strip at 212° F.	Pass	Pass	Pass
Gas-Oil Inspections			
Sp. gr. at 60° F.	0.8540	0.8540	0.8540
Gravity, °A.P.I. at 60° F.	34.2	34.2	34.2
A.S.T.M. distillation:			
I.B.P., °F.	560	560	560
5 per cent	576	576	576
10 per cent	578	578	578
20 per cent	582	582	582
30 per cent	585	585	585
40 per cent	590	590	590
50 per cent	594	594	594
60 per cent	598	598	598
70 per cent	608	608	608
80 per cent	614	614	614
90 per cent	625	625	625
95 per cent	633	633	633
E.P.	649	649	649
Per cent recovery	98.5	98.5	98.5
Per cent residue	1.0	1.0	1.0
Per cent loss	0.5	0.5	0.5
Flash, °F. (P.M.C.C.)	285	285	285
A.S.T.M. pour (max.), °F.	30	30	30
S.U.v.'s at 100° F., sec.	45.5	45.5	45.5
S.U.v.'s at 122° F., sec.	38.0	38.0	38.0
Color, A.S.T.M.	1—	1—	1—
Fuel-Oil-Bottoms Inspections			
Sp. gr. at 60° F.	0.9076	0.9076	0.9076
Gravity, °A.P.I. at 60° F.	24.4	24.4	24.4
Flash, °F. (C.O.C.)	445	445	445
Fire, °F. (C.O.C.)	495	495	495
A.S.T.M. pour (max.), °F.	90	90	90
S.F.v.'s at 122° F., sec.	64.5	64.5	64.5
B.s. and w by centrifuge, vol. per cent	0.10	0.10	0.10



20-ft. Pumping Head in Low Head Cooling Towers

The definite advantages of mechanical draft cooling towers were, to a slight extent, offset in the early designs due to the fact that power for mechanical draft was necessarily added to the power for water pumping, and the total operating cost thereby increased.

With the development of "low-head" tower design, pumping in Foster Wheeler towers was reduced to a 20 ft. head, which saved approximately enough power to operate the mechanical draft; thus the power costs are practically equal.

In addition to low pumping and fan power, the towers are smaller in overall dimensions, require less material to fabricate, and offer less wind resistance.

The outstanding advantages for refinery service include:

1. Water cooled in the quantity, and to the temperature specified, regardless of climatic conditions.
2. Minimum water loss, due to controlled air velocities, spray eliminators and absence of wind effect.
3. Low maintenance cost.
4. High reliability due to simplicity of construction and light weight of axial flow fans.

Foster Wheeler Corporation, 165 Broadway, New York, N. Y.

FOSTER WHEELER

HOW FRANKS MFG. CORP. WELL SERVICING AND DRILLING UNITS SAVE WELL SERVICING COSTS

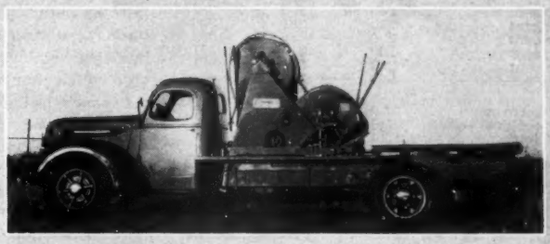
A major oil company in East Texas is using Franks servicing units, mounted on trucks, to service 1,000 wells. Individual derricks for the 1,000 wells would cost approximately $2,000,000 in this territory. One Franks unit of sufficient capacity will service approximately 100 wells. Each unit costs what 10 individual derricks would cost. Therefore, the Franks units are effecting a net savings of the cost of 90 derricks out of each 100.

Franks telescoping well servicing units are made in sizes from single and double pole masts to 90 ft. telescoping open face derrick types for depths from the shallowest to 8,000 feet. Units without derricks will service to 10,000 feet. The derricks are mechanically raised and fold down over the truck for transportation. Crown block and lines remain strung while moving.

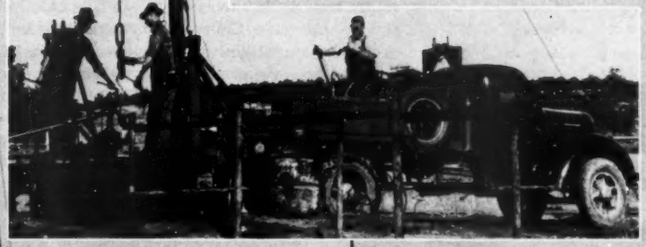
See Franks representatives listed below, or write for further information and complete specifications.

Franks single pole 55' unit. Telescopes to 34'

Franks 90' servicing unit for depths to 8,000 ft.



Franks unit without derrick for territories having individ- derricks. Unit also has drum for sand reel. Note bed-space on truck.



FRANKS REPRESENTATIVES

Cable Address: FRANSI

Export Office: A. V. Simonson, 149 Broadway, New York, U. S. A.
Texas, Gulf Coast, Arkansas and New Mexico: R. M. White, Neil P. Anderson Bldg., Fort Worth, Tex.
Oklahoma, Kansas, Rocky Mountains: W. R. Brown, Box 137, Whittier Sta., Tulsa, Okla.
Illinois Basin and Michigan: Glen L. Wigton, Box 26, Vincennes, Ind.
California: Hillman-Kelley, Inc., 2441 Hunter Street, Los Angeles, Calif.

FRANKS MFG. CORP.
WELL SERVICING AND DRILLING UNITS
TULSA, OKLAHOMA

products were drawn off in separate cuts. These cuts were blended together to make 300°, 350°, and 400° F. end-point gasolines; the corresponding 300°-525°, 350°-525°, and 400°-525° F. kerosenes; a 525°-650° F. gas oil; and a fuel-oil bottoms containing all material boiling above the gas oil. Complete tests were run on all of the blended products, and the results are reported in Table 15, together with the corresponding yields. The gasolines shown in this table were substantially butane-free, as most of the small amount of butane in the crude was taken over and collected with the lighter constituents of the gas.

TABLE 16—EVALUATION OF 37.6-GRAVITY EAST TEXAS CRUDE

Fortifications of Gasolines

Yields Based on Crude

	Vol. %	Wt. %
Gasoline A as distilled	24.5	21.5
Normal butane	2.1	1.6
Fortified Gasoline A	26.6	23.1
Gasoline B as distilled	30.6	27.3
Normal butane	2.7	2.0
Fortified Gasoline B	33.3	29.3
Gasoline C as distilled	35.4	32.0
Normal butane	3.2	2.4
Fortified Gasoline C	38.6	34.4

Inspections of Fortified Gasolines

	Gasoline A	Gasoline B	Gasoline C
Sp. gr. at 60° F.	0.7230	0.7358	0.7351
Grav., °A.P.I. at 60° F.	64.2	60.8	61.0
A.S.T.M. distillation:			
I.B.P., °F.	97	96	107
5 per cent	126	122	130
10 per cent	143	140	146
20 per cent	167	183	185
30 per cent	187	208	219
40 per cent	203	224	239
50 per cent	217	238	260
60 per cent	228	253	282
70 per cent	239	269	308
80 per cent	250	288	336
90 per cent	260	315	371
95 per cent	282	337	391
E.P.	301	350	400
Per cent recovery	97.0	97.0	97.0
Per cent residue	1.0	1.5	1.0
Per cent loss	2.0	1.5	2.0
Per cent rec. at 158° F.	15.5	14.0	13.0
Per cent rec. at 183° F.	28.0	20.0	19.5
Per cent rec. at 212° F.	46.5	33.0	28.0
Per cent rec. at 221° F.	54.0	38.0	31.0
Per cent rec. at 284° F.	95.5	77.5	61.0
Per cent rec. at 392° F.		81.0	95.5
R.v.p., lb./sq. in.	9.8	9.4	9.3
Doctor test	Neg.	Neg.	Neg.
Corrosion, copper strip at 212° F.	Pass	Pass	Pass
Color, Saybolt	+30	+30	+30
Octane, C.F.R.-M. (clear)	69.8	64.2	61.5
Octane, C.F.R.-M. (1 cc. TEL)	81.0	75.7	73.5
Octane, C.F.R.-M. (3 cc. TEL)	88.2	84.1	82.3

In the light of the studies of the natural gasolines, it seems likely that the 300° end-point material reported in Table 5 would make a good base stock for the production of aviation gasoline. That is, after the addition of enough isopentane to make 7.0-lb. R.v.p. the octane number (leaded) would probably be high enough to meet the Army-Navy specifications of 91, and the distillation range should also be satisfactory.

In order to determine the variation of gasoline quality and yield with vapor pressure, the three gasolines were fortified to approximately 10-lb. R.v.p. with butane and then were tested. Table 16 gives the data for this operation.

The foregoing evaluations are illustrative of the kind of studies that should be made to determine the characteristics of petroleum products. In conclusion, it cannot be stressed too strongly that such knowledge of the character of the charge stock and products is vital in studying the economics of any process.

Suggested FIELD PRACTICES . . No. 13

Weeding Out Profitless Wells May Increase Lease Revenue

By T. P. SANDERS

ONE of the most important duties of the field supervisor in an oil-producing concern is the systematic elimination of unprofitable wells. On large leases it has often been discovered that a well has been operated at a loss over a long period and has thereby erased a large share of the profits from the more prolific wells. Although this condition is readily corrected when once it is recognized, it still exists on many leases unknown to the supervisors. Reasons why unprofitable wells often fail to call attention to themselves may be listed as follows:

1. Some supervisors fail to evaluate the individual wells until the lease itself ceases to show a profit. Revenue and expense records are nearly always kept for the lease as a whole and not for the well. While the lease profit-and-loss sheet shows the balance on the right side of the ledger there may appear to be little necessity for delving into the individual-well costs. Yet when lease profits have disappeared, an investigation is always launched, and usually at least one well is discovered which should have been eliminated or changed many months before. Then the supervisor may call attention to his discovery so loudly that his failure to have recognized it earlier will be completely overlooked.

2. Production tests for individual wells are often misleading in that the pumper, having insufficient time, inclination, or facilities for a proper test, may resort to a "boiler-house test." In this case he may repeat the same figures from some former test, decline them slightly, or divide the production pumped by several wells into the same tank. Management must share the blame for "boiler-house tests." Probably the most common mistake is the practice of calling for these tests at too frequent intervals. This tends to discount their importance in the mind of the pumper. Obviously, the first necessity in determining a well's profit status is accurate knowledge of its monthly oil production and fairly accurate knowledge of its water production.

3. Many opertaors have no yardstick with which to judge whether a well is self-supporting or not. It is far easier to single out the unprofitable wells if the operator has accurate information as to how much oil and water constitutes profitable production under various conditions. One major concern, in dealing with this problem of weeding out unwanted wells, chose to establish a system of cost records for individual wells. Due to the enormous amount of detail, the company could not afford to continue this system indefinitely, but it was maintained long enough to define profitable production under all usual conditions. With this accumulated information the supervisor is able to tell merely from production tests and operating conditions whether or not any certain well needs closer investigation.

If an investigation is made, it must determine what expense can be saved by eliminating the well. By abandoning a well on a large lease, especially when it is pumped from a central power, very little improvement may be realized in the lease operating cost. However, it may be possible to rework the well or to plug it back to an upper sand so that the equipment and pumper's time can be used to better advantage.

Disposal of the Unprofitable Well

Before a well is abandoned, possibilities for improvement must be studied. Restorative measures such as acidizing, shooting, plugging off water, or installing new equipment to handle more water have usually been exhausted by the time abandonment is considered. There may remain the chance of opening a deeper oil zone or of producing an upper sand. Also, the well may be used as an input well in a secondary-recovery program or for water disposal. Imagination may evolve more unusual ways of utilizing old wells in the future. For example, in closely drilled areas where casing is subjected on the outside to corrosive water sands, an old well might be filled with junk steel and used for cathodic protection of the casing of nearby wells. Perhaps this would require too much electric power, or perhaps it would set up an undesired electrolytic condition within the casing of the pumping wells. It is included here only as an indication of future possibilities.

When all possibilities have been exhausted, the unprofitable well is usually sold for junk, or the company may salvage the casing and other equipment before plugging the well. In order to save as much of the casing as possible, a chart has been provided on Page N-38 of the Producing Equipment Directory. This makes it possible to determine how much of the pipe is free in the hole before it is shot off or cut off prior to pulling.

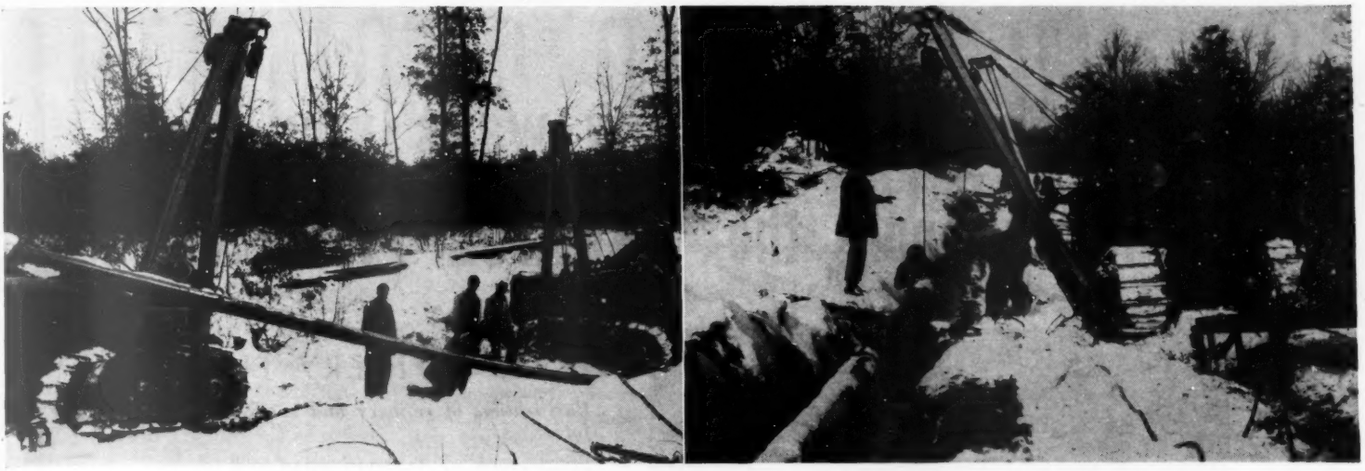
●

BOOK REVIEW

DOING BUSINESS UNDER THE DEFENSE PROGRAM, prepared by the staff of the United States Law Week. Price $1.

This 124-page volume constitutes a handbook of the laws governing business practices during rearmament. Subjects covered by the book include: Bidding on defense contracts, the rules of both big and small orders; negotiating government contracts, the procedure and terms when departments work directly with a producer rather than throw open to bid; securing advances for plant facilities; assigning claims to secure loans; meeting the special labor requirements set for governmental contracts; planning tax amortization at the new accelerated rates on defense facilities; and handling sales contracts and other relations with those in military service and those who may enlist or be drafted. Much of the material included in the book is not available elsewhere under one cover.

Copies of the book are available from the Bureau of National Affairs, Washington, D. C., at the established price of $1 for single copies.



Left: Two tractors making an over-bend on the Shell line; the tractor at right holds down the completed section while the one at left makes the bend. Right: Side-boom tractors lowering a section of the 59-mile line into the ditch

Shell Lays Gasoline Line Across Massachusetts Industrial Area

OPERATION of the first pipe line ever constructed to serve the Boston market was started last week by Shell Oil Co., Inc. The new line, which will transport only finished petroleum products, links the 45,000,000-gal. storage capacity of Shell's Fall River ocean terminal with a newly erected bulk plant at Waltham, located on the outskirts of Boston.

Operating on a 24-hour basis, the pipe line is capable of supplying in excess of 420,000 gal. per day, and is regarded as a highly important part of the New England defense system. In the event of a national emergency, a large portion of Boston's petroleum requirements can be currently supplied by the line, relieving rail, water, and highway transportation facilities for the movement of other supplies into and out of the city.

Beginning at Fall River, the pipe line runs roughly north for 59 miles to Waltham where it discharges into 5,000,000-gal. storage. The right-of-way crosses over 400 separate properties and extends through the towns of Fall River, Freetown, Berkley, Taunton, Norton, Mansfield, Foxboro, Medfield, Walpole, Sherborn, Natick, Wayland, Weston and Waltham.

Work on the line, which was built by local labor under the direction of Shell company engineers, began in the fall and proceeded at record speed to insure completion before severe weather set in. At peak periods, over 600 men were employed in the various phases of laying the pipe line, the construction contract for which was held by a New England firm.

Rough terrain, rock formations and swamplands encountered along the right of way made the line, mile for mile, one of the most difficult yet constructed in this country, according to the engineers in charge. Between 10 and 15 miles of the line had to be ditched and covered by hand. Three rivers were traversed: the Assonet, with a width of 613 ft. and a maximum of 21 ft. at the point of crossing; the Taunton, which is 194 ft. wide and 10 ft. deep at the crossing site; and the Charles, which was crossed at a location where it is 118 ft. wide and is relatively shallow. The crossing of the first two involved the use of steam dredges.

A pending channel-deepening project made it necessary to lay the pipe line 18 ft. below mean low water in the Taunton River, resulting in the pipe being buried from 8 to 10 ft. below the present river bed. Extra-heavy river pipe was used for all river crossings. Because of salt water in the Assonet and Taunton rivers the pipe was coated with pipe enamel and wrapped with asphalt-impregnated felt for additional protection. The minimum underground depth for the pipe line at any point is 3 ft. and the maximum depth is 11 ft. Under all railroads and under most highways and roads the line was laid by a tunneling operation so that traffic was undisturbed.

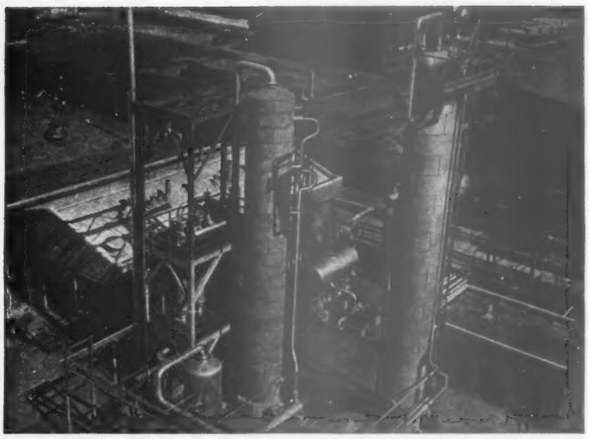
The pipe used in the line has an outside diameter of 6⅝ in. and ¼-in. walls and is made of mild steel. All joints were tested at the mill and electric-arc welded during the construction of the line. The welding was done by the continuous or stovepipe method with each 40-ft. section being welded onto the line as a whole, rather than three or four sections being joined together and then added to the line.

The Fall River pumping station, the only one on the line, is 6 ft. above sea level while the Waltham plant has an elevation of 65 ft. A duplex reciprocating pump, driven by a diesel motor, will operate at approximately 900 lb. pressure to move products between the two points.

William H. Shelley and Carl W. Marquis, both of the Shell's pipe-line division, supervised the construction of the line. The Lane Construction Co. of Meriden, Conn., built the pipe line. The welding was done by the C. M. Flag Co., also of Meriden, and the river crossings were made by Elliott & Watrous, of Providence, R. I.

Steam dredge digging a trench in the bottom of the Taunton River for the new line between Fall River and Waltham. Because of a pending channel-deepening project the line has to be buried from 8 to 10 ft. below the present river bed

Check below the many ways you can profitably apply the GIRBOTOL PROCESS!



In the REFINERY FIELD:

Purification of refinery and casinghead gas for:

Feed stock of polymerization and alkylation plants.

Recovery of sweet propane and butane fractions.

Reduction of corrosion in lines and processing equipment.

Synthesis of iso-octane.

Synthesis of hydrogen.

Synthesis of industrial chemicals.

In the NATURAL GAS FIELD:

Purification of natural gas for:

Industrial and domestic consumption.

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Repressuring sweet oil fields.

Manufacture of carbon black.

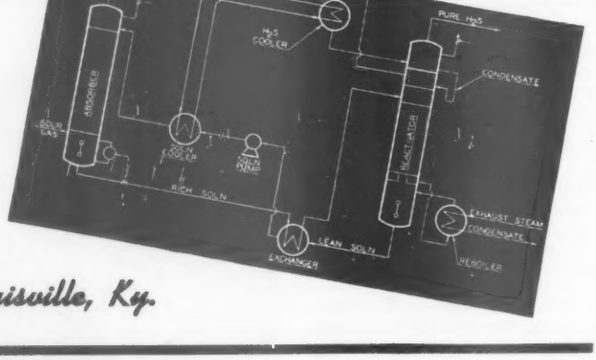
Production of blending agents for high test motor fuels.

Gas engine fuel.

Camp cooking and heating.

Water well lift pumping.

Purification and dehydration of natural gas to prevent corrosion and hydrate formation in transmission lines and equipment.



Girbotol purification plants are available in 6 different *standard* sizes, which are largely factory assembled and can be installed in the field at minimum cost, as well as in large *individually engineered* set-ups. Let us send you complete details—and PROOF that the patented Girbotol Process will *save you more money* and remove H_2S and CO_2 *more efficiently* than any other method.

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QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

Low-Temperature Strength Of Cast Irons

Have you any information on the properties of cast irons, including strengths as well as impact resistance, at subzero temperatures?—N. C. N.

This question has been answered in Nickel Cast Iron News of the International Nickel Co. in much the following way:

Very few tests have been made on either alloy or plain cast irons at low temperatures and the only ones available to us are:

LOW-TEMPERATURE-IMPACT PROPERTIES OF ALLOYED AND PLAIN CAST IRONS

Material—	Composition, percentage					Foot-lb.‡ Room temp.	Foot-lb.‡ —45° F.
	C	Si	Ni	Cr	Cu		
Plain cast iron	3.44	1.96	...	...	...	39	29
Nickel cast iron*	2.76	2.02	1.75	...	...	44	38
Ni-Resist	2.73	1.59	13.76	1.95	6.00	†55	50
Invar Cast Iron	2.50	1.40	30.00	4.00	...	81	70

*High-test type. (develops up to 60 ft. lb.). †Values as high as 70 ft. lb. have been developed in softer grades. ‡Bar 1.20 in. diameter by 6 in.—broken "as cast." Izod-type test.

The plain cast iron shown is a common type which might develop a strength of approximately 30,000 lb., whereas the nickel cast iron is a high-test type which would develop a strength of about 50,000 lb. The impact test described is made by breaking in the Izod machine a 1.20-in. diameter bar in the "as cast" condition. An ordinary high-test iron was selected which produced room-temperature impact strengths averaging 44 ft.-lb.

The discussion is engaged in to emphasize the point that castings for low-temperature service are made as tough as possible, so that the embrittling effects of low temperatures are compensated for. It is, therefore, not unusual to find 1.50-2.00 per cent nickel in such castings solely for the purpose of increasing their toughness.

Since the relationship between composition and toughness and strength is not thoroughly worked out for low-temperature service, it is customary to recommend that the iron used for low-temperature service possess a room-temperature strength approximately 20 to 30 per cent higher than is necessary for the same castings operating under room-temperature conditions. Since the impact strength or toughness of nickel cast irons increases with their tensile strength, this relationship is a fairly safe one to use. Therefore, pumps, compressors, or similar parts which work successfully under room-temperature conditions and made of an iron that conforms to A.S.T.M. Class 30 type of composition, may also be used at low temperatures in the range of —50° to —150° F., providing you select for the prevailing section or thickness of the casting a composition in the table for irons that is 10,000 lb. stronger.

Control of Lime Neutralization

As a means of controlling sulfur corrosion in our plant we are using lime and checking the hydrogen sulfide content of the residual gas from the unit. We would appreciate some information as to about what concentration of hydrogen sulfide we could use as a safe control point.—L. G.

Little experimental work relating the degree of corrosion to the amount of hydrogen sulfide in the residue gas has been conducted. The usual conclusion is that enough lime is being used if over a period of months the plant corrosion has been substantially eliminated. In no instance, however, is it necessary to use as much lime as the stoichiometry of the chemical equation would indicate. A much smaller amount of lime has been found to decrease the corrosion rate by 75-95 per cent. In fact, the sulfur content has no direct relation to lime consumption because some sulfur compounds produce corrosion and others have little effect.

Authur Marks, in his paper before the A.P.I. in November 1936, recommends that lime control be centered about the condition of the coke (or scale) deposits that are produced. If the deposits are just alkaline, the rate of corrosion is materially reduced.

Control by means of the sulfide content of the residue gas has been mentioned by only two investigators. R. E. Puckett in The Oil and Gas Journal of September 23, 1937, Page 44, finds that 0.2 lb. of hydrogen sulfide per 1,000 cu. ft. of gas (1,400 grains per 1,000 cu. ft.) is a permissible amount for a high-pressure still. However, Whitman and Roberts in their A.P.I. paper of December 1929, entitled, "Pressure Still Corrosion," found the following relationship between amounts of lime, degree of corrosion, and amount of hydrogen sulfide.

Percentage sulfur in stock	Percentage protection	Residue gas, grains, H_2S per 1,000 cu. ft. gas	Lime, lb. per 100 gal.
0.25	0	1,500	none
0.25	80-97	200	1.0
0.50	20 approx.	500-750	1.0
0.50	.....	200	2.0

The apparent discrepancies in the two sets of results cannot be considered as errors. Lime is more effective with some stocks than others and the degree of corrosion that one refiner can permit may be totally unsatisfactory to another.

Simplified Flow Diagrams
Sulfur Removal by Caustic Washing

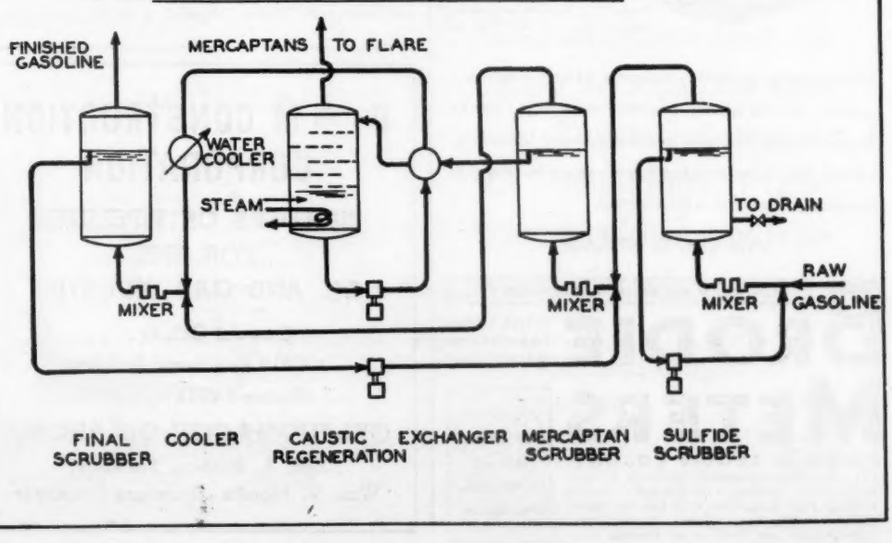
We have outlined the flow diagram which is attached, for the treating of gasoline with caustic. Will you please discuss the flow in such a process?—L. G. R.

The removal of hydrogen sulfide and mercaptans may be accomplished by means of contacting with caustic solution (sodium hydroxide). The hydrogen sulfide produces sodium sulfide which is a stable compound that cannot be regenerated by heating or stripping with steam. The mercaptans, however, unite with the caustic in such a way they can be removed from solution by steaming.

Thus, a single scrubber can be used to absorb both impurities but the solution becomes gradually weaker by absorption of hydrogen sulfide and must either be discarded, or part of it must be replaced with fresh solution. For this reason several refiners have conducted the contacting by two or three stages as indicated in the diagram.

The three-contact system has the advantage of a final caustic wash with strong solution. This assures a thorough removal of sulfur, it permits less exact control of the two preliminary washes, and it permits economy because the solution that is discarded from the first wash is almost completely spent. In addition, a somewhat dilute solution is advisable for hydrogen sulfide whereas a concentrated solution (14° B.) is best for mercaptan removal. The solution recirculated through vessels 2 and 3 is regenerated in a continuous system by heating to the boiling point of the solution and stripping with a small amount of steam. This solution is not consumed except by the gradual absorption of hydrogen sulfide which may not have been absorbed in the first scrubber.

SIMPLIFIED FLOW DIAGRAMS — CAUSTIC WASHING SYSTEM



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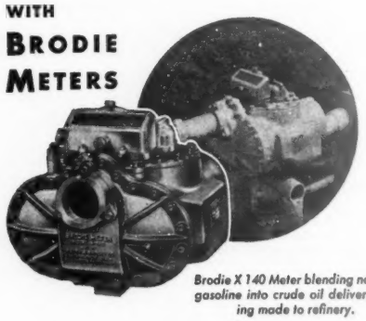

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Pipe-Line Activity

Stanolind Plans Looping of Texas to Whiting, Ind., Line

This week specifications will be issued by Stanolind Pipe Line Co. to contractors for the construction of loops between Rogers Junction and Fox Junction in Texas and Oklahoma, as well as between County Line Junction and the South Canadian River in Oklahoma. The work will call for the laying of 57 miles of 8-in. and 18 miles of 12-in. This represents the first step in a program which will fill in the gaps between loops already installed on the system. A looping program has been planned for coming months for work to be done at various points on the system between Texas and Whiting, Ind. This, together with looping on the Wyoming line, a short extension, and take-up jobs represents more than 250 miles of pipe. The work is planned in 10 jobs which will be let at different dates in the next few months. This work does not include the laying of lines on 15 miles of right-of-way in the vicinity of the Wilmington, Ill., TNT plant nor the extensive repair work which has been carried on through the winter on the company's lines in North Texas.

The looping program which will start soon on the Texas-Whiting trunk line provides for separating three grades transported to the Standard Oil Co. (Indiana) refineries.

Rincon-Brownsville Project of W. R. Davis Has Been Abandoned

HOUSTON, Tex.—According to present plans no work will be done this year on the 120-mile pipe line between the Rincon field and Brownsville, Tex. This project had been contemplated by W. R. Davis & Co. before a half interest in the company's properties in that area was acquired recently by Continental Oil Co. It is possible that a line in this area may be built in 1942.

Standard Lines Increased Shipments in 1940

Delivering a total of 224,438,000 bbl. during 1940, the nine pipe lines in the eastern group formerly included in the Standard Oil listing, showed a 38 per cent increase in aggregate business during the year over 1939, and established a new record for 12 months' service. The increase was general in the group, with all lines reporting increases over the former record year, 1939.

The December deliveries for the district aggregated 18,112,000 bbl., a 9 per cent increase over November runs for the companies, and 10 per cent ahead of deliveries for a year earlier. Three of the lines, Eureka, Southern and Illinois, showed a slight reduction in operations during the December period, with the remaining six firms making up the advance.

Buckeye Pipe Lines led the remainder of the companies for 1940 deliveries, with a total of 81,171,000 bbl. for the 1940 period. Second place was taken by the Illinois Pipe Line Co., with 68,473,000 bbl. Buckeye runs showed an increase of 32,499,000 bbl. over the 1939 figure while Illinois Pipe Line deliveries were up 11,797,000 bbl.

Combined deliveries of these two companies account for 60 per cent of the total deliveries of the eastern group during the 1940 period. Comparative deliveries for the nine companies during 1940 and 1939 follow:

	1940 Bbl.	1939 Bbl.
Buckeye Pipe Line	81,171,000	48,672,000
Eureka Pipe Line	8,321,000	6,249,000
Illinois Pipe Line	68,473,000	56,676,000
Indiana Pipe Line	21,058,000	20,905,000
National Transit Co.	15,551,000	12,110,000
New York Transit Co.	6,985,000	3,885,000
Northern Pipe Line Co.	7,945,000	3,546,000
Southern Pipe Line Co.	3,404,000	1,676,000
South West Pennsylvania Pipe Line	11,530,000	8,837,000
Totals	224,438,000	162,556,000
Daily Average	613	445

Sohio Pipe Line Ships Crude to Leonard Plant

MT. PLEASANT, Mich.—Illinois crude consigned to Central Michigan refineries was scheduled to start moving north in Sohio's pipe-line the latter part of this month. Contracts closed earlier in January between Leonard Pipe Line Company and Sohio call for an initial delivery of 100,000 bbl. of Illinois to be laid down at Leonard's Crystal station over a period of 90 days or less.

Leonard Pipe Line will reroute the Illinois oil through its own line to Leonard Refineries, Inc.'s Alma plant. This plant, it was reported, will be operated exclusively on Illinois crude for at least 90 days on an experimental basis. Leonard will continue to run 100 per cent Michigan crude at the St. Louis, Mich. plant.

Both Roosevelt at Mt. Pleasant and Mid-West at Alma also were reported considering purchases of Illinois crude within the next 60 days if Michigan supplies continue to go lower.

Refined-Products Shipments Are Studied in Southeast

In reviewing the relation of shipments of refined products to railroad tonnage and revenues in the southeastern states where important pipe-line projects are contemplated for construction, it may be observed that shipments of gasoline and other refined products represent only a small fraction of what is handled by railroads in this section.

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Pipe-Line Personalities . . . . . J. R. Murphy

J. R. MURPHY, general superintendent, Gulf Refining Co., Tulsa pipe-line division, grew up on a farm near Genesee, Potter County, Pennsylvania, and at the age of 19 went to Wellsville, N. Y., where he worked at iron molding for 1½ years. For several years he was with New York Transit Co., engaged in construction on the line between Olean, N. Y., and Bayonne, N. J. In the years of 1906 and 1907 he was with Buckeye Pipe Line and the pipe-line operations of Ohio Oil Co., now Illinois Pipe Line Co., in the vicinity of Stoy, Ill., which was then a boom town. He came to Oklahoma in October 1908 and was in the emergency gang of Gulf Pipe Line at McAlester, for several months before he became gang pusher at Glenn pool. In these years he worked at various times as relief engineer at pumping stations at Watkins and Kiefer in the Glenn pool area. He has been with the Gulf Pipe Line organization ever since then. Between 1912 and 1913 he was gager in the boom areas of Oklahoma. For the next 10 years he was district foreman in the El Dorado, Kans., district. From 1923 to 1933 he was district foreman at Seminole, Okla., until he succeeded T. D. Hanratty as division superintendent at the Tulsa office. On the death of J. N. Hunter in October 1939 he was promoted to the position of directing operations in an area extending from New Mexico to Ohio.

Among the railroads in the section which may be served by pipe-lines are the Southern Railway, Louisville & Nashville Railroad, Atlantic Coast Line, Seaboard Air Line and the Central of Georgia, controlled by Illinois Central. There is also a state-owned railroad operated in Georgia.

Although no breakdown of revenue freight is obtainable to show the importance of gasoline shipments, the I. C. C. revenue classification of petroleum products provides an approximate picture. The following data are drawn from the 1939 reports of the carriers affected.

Southern reported total freight revenues in petroleum products of $4,188,000. This represented 4.8 per cent of total freight revenues and about 4 per cent of the tonnage moved over the road. In 1934, this same classification had shown 8.4 per cent of total revenues and 5.3 per cent of tonnage.

Louisville & Nashville reported $2,864,000 in freight of petroleum products, equivalent to 2.2 per cent of total traffic revenue and 3.6 per cent of tonnage. While this is a slight increase in tonnage as compared with the 1934 results, revenues from that class of freight in 1934 were 4.9 per cent of the total.

Atlantic Coast Line, with a network of lines and feeders through Virginia, the Carolinas, Georgia, Alabama and Florida, reported petroleum revenues of $1,709,000. This was equal to 4.7 per cent of total revenues and represented 7 per cent of tonnage. In 1934 revenues from this source were 11 per cent of the total, while tonnage equaled 9.3 per cent.

Seaboard Air Line, operating generally to the east of Atlantic Coast Line's area, nearer to the coast, reported petroleum revenues of $1,604,572, or 4.6 per cent of total revenues, representing 5 per cent of tonnage movement. In 1934 the road reported that 11.5 per cent of its revenues came from movement of petroleum products, while the tonnage amounted to 7.6 per cent.

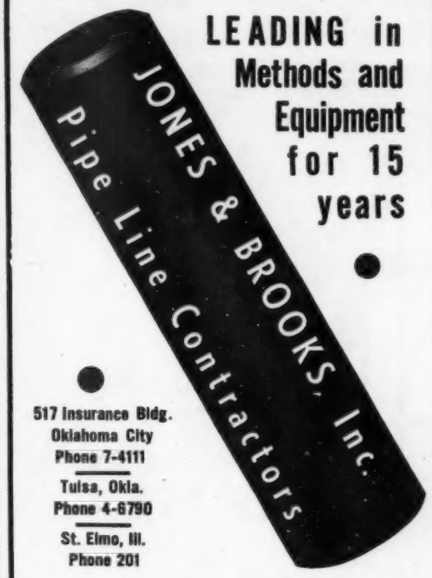
The Central of Georgia had revenues of $756,000 in petroleum traffic, or 6 per cent of revenues and 4.4 per cent of tonnage.

Cities Service Installs Compressor at Pampa

The Cities Service Gas Co. has recently installed a 1,000 hp., 10-cylinder vertical V type compressor at the Pampa, Tex., station on the 20 in. line from the Panhandle field to Wichita, Kansas City, and other northern markets.

Baird Refining Co. Lays Line In North Central Texas

ABILENE, Tex.—Baird Refining Co., Baird, Tex., is pushing work on its new 25-mile, 4-in. crude-oil line from the Goldsboro and Novice fields in Coleman, County, West Central Texas, to a branch line and thence to its refinery at Baird, Tex. Costing an approximate $150,000, the line will provide the first outlet for these two fields since their discovery several years ago. Drilling activity has been at a standstill for several months due to lack of outlet other than truck. About 10 miles of survey work for the 26-mile line has been completed and the laying of pipe is expected to start within two weeks. Having a capacity of about 5,000 bbl. daily, the line will extend from the field to the refining firm's gathering system in the shallow Hickman-Flores field in Callahan County, 6 miles southeast of Baird.



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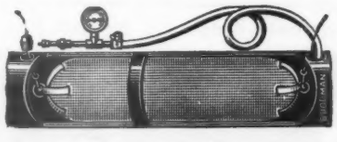

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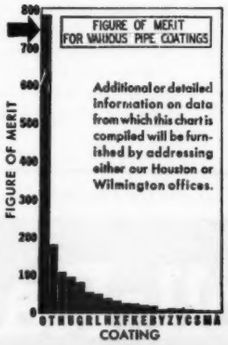

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions remained below last year's average levels during the past week and also showed a slight decline from the previous week. There were 12 more oil wells completed and 21 fewer gas wells, while dry holes remained the same.

The week was signalized mainly by the completion of tests proving up deeper pays, on the Gulf Coast, in Kansas, Illinois, and Arkansas. A whole new area is opened up in the Great Plains region of Alberta by the successful completion of a test near Steveville, and the prolific Griffin area in Illinois and southwestern Indiana is apparently being extended farther to the south by a new pool opener. This trend permitted Indiana to more than triple its production in 1940

WEST TEXAS: One new deep-level discovery well was completed on the east side of the North Cowden field in Ector County during the week, while in the same county and just northeast of the Goldsmith field another possible discovery was testing. Menard County was given a new sweet-gas discovery and marketing plans are already being studied. Holding top interest in Pecos County was the purchase by Stanolind Oil & Gas Co. of the Abell field discovery well and acreage from Taubert-McKee-Siemonett (p. 216).

TEXAS GULF COAST: Blessing is apparently extended by a well showing distillate to the south of the discovery. Old Ocean is being extended on the east and a slight extension has also been made in South China. After being watched closely for several weeks, the La Ward, Jackson County, test has been abandoned. It is thought to be on the edge of the structure, and interest has passed to a test being spudded 1 mile to the southeast.

ILLINOIS: Although the Rossi Trenton test is not yet officially completed, more than 30 surrounding wells are being deepened to get whatever flush production there may be from this formation. These wells are all old Devonian producers which have declined to below the economic limit, and, except for the Trenton possibilities, would probably be abandoned. Hoodville, a 1940 discovery, has pretty much depleted the Benoist and many wells are being deepened to the Aux Vases. West Liberty continues to give the state its best producers (p. 221).

INDIANA: A new pool is in the offing in Posey County, south and east of New Harmony (p. 224).

MICHIGAN: Bay County's deep test was held up by collapsed drill pipe. The second flowing well in the Beaverton pool was the only event of importance during a quiet week (p. 227).

ARK-LA-TEX: Olla got its 100th well during the week. A deep test in the old Stephens field of Columbia County encountered a saturated oolitic member in the Smackover lime (p. 205).

OKLAHOMA: A reported 4,000-bbl. well in West Konawa and a 300,000,000-cu. ft. gasser in the Chickasha gas field show that Oklahoma is far from through (p. 211).

SOUTHWEST TEXAS: A new deeper sand is in prospect in the East Flour Bluff field. A well ¾ mile north of the Thomaston discovery is reported running higher than the original well. Activity is increasing in La Gloria, Jim Wells County (p. 208).

CALIFORNIA: A successful well in the Panoche district of Fresno County has confounded the pessimists on two counts. It lies north of Coalinga, which was supposed to be the farthest north, and it is producing from the Cretaceous, which is below the lowest pay in all but a few small wells in West Coalinga. Should the well hold up it may encourage Cretaceous prospecting elsewhere in the state. Wilmington is likely to see a revival as a number of locations are started in the Flood Control Channel area (p. 202).

EASTERN TEXAS: Many of the district's wildcat tests staked following the Hawkins discoveries in Wood County, were started the past week. Two deep 8,000-ft. tests were under way in Rusk County; in Smith County two new Woodbine sand tests were starting, and in Upshur County Sun Oil Co. has started work at its 7,000-ft. Ore City test (p. 226).

KANSAS: After a year of linking pools, it appears probable that the Wherry pool may be linked to the Welch-Bornholdt area of Rice and McPherson counties. A successful completion would open up five or six sections. Predictions as to the lowest possible pay continued to take a beating as another pool (Ray in Phillips County) reports saturation in the granite wash below the Reagan sand. A new pool has been found 3½ miles south of Krier (p. 198).

LOUISIANA GULF COAST: Although the discovery well at Westwego is not yet tested, a second location has been staked. These wells are within ½ mile of the Mississippi River across from New Orleans. Farther south, a well drilled on the east bank of the river and directed beneath the river bed extended the Stella field. A new deep sand has been found at Venice and the Iowa deep sand has been extended approximately 1 mile north (p.206).

EASTERN KENTUCKY: The deep play in eastern Kentucky is taking form as one test is headed for the 4,000-ft. level, another reports gas in the Corniferous, and two others are headed for the St. Peter and Brassfield, respectively (p. 224).

APPALACHIAN: The Ohio deep-gas play has moved across the state line into Pennsylvania where Ohio's test had the Onondaga at 1,390 ft. West Virginia's deep test in Harrison County is below 9,800 ft. (p. 210).

CANADA: Turner Valley may have a rival in the new Steveville or Princess field. If the discovery well holds up it may increase activity in the plains area from the border into the Wainwright district (p. 204).

NORTH TEXAS: Three possible field discovery wildcats were in testing stages as the week closed, one each in Archer, Jack and Young counties. New wildcat tests in Clay and Baylor counties during the week kept exploration of the Fort Worth basin on the upturn (p. 214).

WEST CENTRAL TEXAS: Fisher County's still testing new Swastika sand discovery well, Stephenson 1 Maberry, was given another outpost location to boost the total to three active tests in the area. The new location is northwest of the strike, while to the southwest the same operator is drilling below 2,000 ft. at his second test in the area (p. 214).

COMPLETIONS IN ALL FIELDS . . .

(Week ended January 25, 1941)

	Oil	Gas	Dry	Total	1941 total comp. to date	1940 total comp. to date
N. Y., Pa., and W. Va.	64	12	5	81	339	280
Ohio	4	12	7	23	94	55
Indiana	3	0	4	7	26	20
Kentucky	2	1	3	6	32	21
Illinois	31	0	13	44	206	263
Michigan	5	1	5	11	53	88
Kansas	22	2	14	38	118	91
Oklahoma	13	0	8	21	105	111
Nebraska	1	0	1	2	10	0
Texas:						
North Central Texas	22	0	15	37	167	199
West Texas	29	2	5	36	138	124
Texas Panhandle	11	0	0	11	31	48
Eastern Texas	26	0	2	28	88	86
Texas Gulf Coast	12	0	2	14	65	103
Southwest Texas	10	0	17	27	98	149
Total Texas	110	2	41	153	587	709
North Louisiana	7	3	1	11	40	54
Gulf Coast Louisiana	14	0	5	19	57	60
Total Louisiana	21	3	6	30	97	114
Arkansas	2	0	1	3	15	21
Mississippi	2	0	0	2	11	0
Montana	1	0	1	2	22	14
Wyoming	1	0	1	2	15	15
Colorado	0	0	0	0	0	3
New Mexico	6	0	3	9	26	43
California	19	0	2	21	90	78
Total United States	307	33	115	455	1,846	1,926
Total previous week	295	54	115	464		
Week ended Jan. 27, 1940	317	30	375	422		

By
ROBERT INGRAM

East Wherry and Welch Pools May Be Joined by Discovery

POSSIBILITY of a new pool for Rice County, Kansas, was seen this week with the report of a good show of oil midway between the East Wherry and Welch pools at Willis L. Hartman and Sharon Drilling Co. 1 Dresback, E½ SE NE 7-21-6w.

The show was in the conglomerate topped at 3,512 ft. Operators deepened to the chat, topped at 3,523 ft., and penetrated 3 ft. when they ran 5-in. casing to 3,518 ft. and began testing. After a shot from 3,519-24 ft., 3 bbl. of water with a trace of oil were bailed.

Then the casing was perforated at 3,510-18 ft. in the conglomerate and oil rose 850 ft. in the hole in 4 hours. The crew swabbed 32 bbl., then on a 6-hour test swabbed an average of 1.6 bbl. an hour.

The Dresback test is situated on acreage farmed out from Gulf Oil Corp., and Phillips Petroleum Co. holds the diagonal southeast offset. Cities Service holds the east offset tract. In spite of the fact that Dickey Oil Co. drilled a dry hole a mile northwest of the present well, the test is considered one of the most interesting drilled for some time.

Some of the tops logged were Fort Riley, 1,290 ft.; Topeka lime, 2,460 ft., and the Lansing-Kansas City lime series, 2,990 ft.

Several Pools Extended

The Hagen pool of southeastern Barton County was apparently extended ⅝ mile northeast at Herndon Drilling Co. 1 Minnie Hagen, N½ NE SW 20-20-11w, where the hole filled 600 ft. with oil after drilling into the Arbuckle dolomite to a total depth of 3,331 ft. and treating with acid.

Northeastern Barton County gained a new shallow oil pool at a wildcat test 3½ miles south of the Krier pool, the nearest production. It was C. W. Piggott and George F. Johnston 1 Beran, NE cor. 24-17-12w, which filled 1,000 ft. with oil over night while cleaning out from a total depth of 3,122 ft. in the Lansing series.

Operators were underreaming the 6-in. casing set at 3,045 ft. and will lower the string to 3,115 ft. Darby Petroleum Corp. and Magnolia Petroleum Co. own the diagonal northeast offset, and Skelly Oil Co. owns the east offset.

Meantime an oil find was reported from Cetal Oil Co. 1 Hixenbaugh, SE NE NE 1-6-21w, which may extend the Ray pool of Phillips County into Graham County and give it a second pay zone. The well found fair saturation in the granite wash at 3,533 ft. after missing the Arbuckle lime and the Reagan sand. Casing was set and the well will be tested.

SUMMARY OF COMPLETIONS

Kansas

	No.	Bbl.	Footage
Oil wells: Silica	2	336	6,582
Kraft	1	23	3,297
Bemis-Shutts	2	6,000	7,021
Zenith	3	338	11,383
Trapp	2	222	6,699
Other fields	12	9,026	.....
Gas wells: Fields	2	*24.2	7,795
Dry holes: Fields	10	.....	31,525
Wildcats	4	.....	12,869
Total	38	.....	87,171
Recompletions	3	3,047	.....

Nebraska

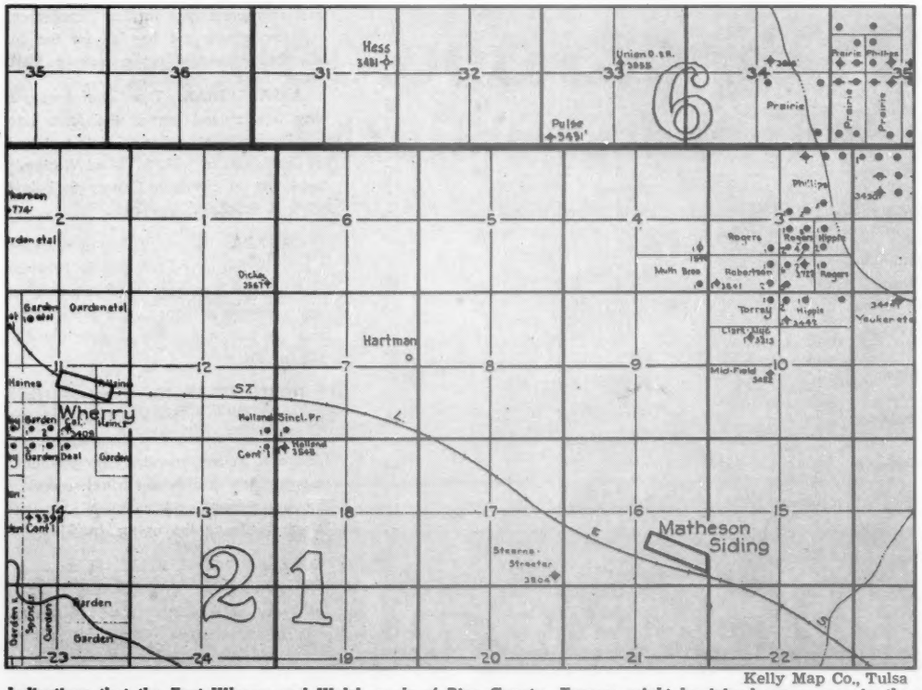
Oil wells: Falls City	1	150	2,278
Dry holes: Wildcats	1	.....	2,514
Total	2	.....	4,792

*Million cu. ft.

Dakotas Are Leased

The six wells now in the Ray pool produce from the shallower Reagan sand. Importance of the show was emphasized by the fact that the Ray pool, a 1940 discovery, is in the vanguard of northerly production on the Barton arch, or Central Kansas uplift.

Meantime attention of lease men turned to the spectacular play which swept through the Dakotas during recent weeks and was last reported to have resulted in the leasing of a solid strip of land, 30 miles wide, from the Canadian border to the northern Nebraska State line. As in other leasing plays of the Great Plains area, however, companies were protected against hurried drilling, and it may be some time before actual wildcatting of any importance get under way.



Kelly Map Co., Tulsa

Indications that the East Wherry and Welch pools of Rice County, Kansas, might be joined were seen in the probable pool opener between the two brought in this week. It is Willis L. Hartman and Sharon Drilling Co. 1 Dresback, E½ SE NE 7-21-6w. The new well is shown here in relation to the two pools

KANSAS COMPLETIONS

Barton County

Ainsworth pool: Central Petroleum 1 Hogan, N½ NE SE 34-16-13w, dry, T.D. 3,410 ft., Topeka 2730 ft., Lansing 3,128 ft., Sooy 3,310 ft., Arbuckle 3,397 ft.

Albert pool: Hannum Drlg. 1 Skolant, NW NW NE 27-18-15w, flowed 23,000,000 cu. ft. gas, LaMotte sand 3,448-3,500 ft.

Karber pool: Stanolind 1-B Musenberg, E½ SE SE 1-19-11w, pumped 64 bbl., Arbuckle 3,357-64 ft., T.D. 3,377 ft.

Silica district: Champlin Ref. 4 Clawson, N½ NE NW 17-20-11w, pumped 51 bbl., Arbuckle 3,309-30 ft.

Magnolia 20 Roetzel, SE cor. 24-20-11w, pumped 285 bbl., Arbuckle 3,248-52 ft.

Beaver pool: Martin & Hearing 2 Feltes, SE NW SE 8-16-12w, 3,000 bbl., Topeka 2,893-2,901 ft., T.D. 2,904 ft.

Kraft pool: Magnolia 1 Riemann, S½ SE SE 4-17-11w, swabbed 23 bbl. an hr., Arbuckle 3,289-97 ft.

Wildcat: British-American 1 Linder, NE NE SW 34-17-14w, dry, T.D. 3,507 ft., Topeka 2,880 ft., Sooy 3,420 ft., Lansing 3,212 ft., Arbuckle 3,449 ft.

Butler County

Reynolds-Shaffer pool: O. J. Connell 1-A Tatum, SW SW NW 9-27-6, pumped 30 bbl., Viola 3,153-58 ft.

Stern pool: Cromwell & Lewis 8 Stern, SE SE NE 33-27-6, pumped 35 bbl., Viola 3,084-90 ft.

Cromwell & Lewis 2 Shriver, NW NW SW 34-27-6, pumped 35 bbl., Viola 3,085-96 ft.

Cowley County

Couch pool: Ryan Consolidated 1-A Whalen, SW SW NE 12-30-5, dry, T.D. 3,507 ft., Kansas City 2,190 ft., Bartlesville 2,790 ft., base Mississippi 3,235 ft., Arbuckle 3,321 ft.

W. M. McKnab 1 Roberts, NE NE SW 13-30-5, dry, T.D. 2,896 ft., Bartlesville 2,810 ft., Mississippi lime 2,882 ft.

Ellis County

Burnett pool: Dickey Oil 5-B Henderson, N½ SE SW 6-11-17w, potential 1,505 bbl., Arbuckle 3,464-67 ft.

Bemis pool: Cities Service 1-C Collahan, SW NW SE 24-11-17w, 3,000 bbl., Arbuckle 3,467-72 ft.

Deep Rock 30 Baumer, W½ NW SE 27-11-17w, 3,000 bbl., Arbuckle 3,543-49 ft., T.D.

Koblitz pool: Doley 2 Koblitz, W½ SW NW 23-12-18w, old T.D. 3,676 ft., recompleted 3,000 bbl., Arbuckle 3,668-76 ft.

Hartsook pool: Gulf 1 Brungardt, N½ NW NE 31-13-16w, pumped 287 bbl., 16 hr., Arbuckle 3,473-92 ft.

Ubert pool: Bay 3 Keys, S½ NE SW 1-13-18w, dry, T.D. 3,772 ft., Lansing 3,410 ft., base Kansas City 3,675 ft., Viola 3,766 ft.

Ellsworth County

Wilkens pool: Hollow Drilling 3 Wilkens, S½ NE SW 18-17-9w, 3,000 bbl., Arbuckle 3,248-52 ft.

Heiken pool: Lauck & Moncrief et al 1 Kahler, NL NW SW 23-17-10w, dry, T.D. 3,335 ft., Lansing 2,952 ft., Sooy 3,259 ft., Arbuckle 3,296 ft., show oil 3,309-13 ft.

Greenwood County

K. T. Weideman 2-A Lewis, SW NE SW 25-27-8, deepened from 1,860 ft. to Mississsippi lime 2,417-43 ft., pumped 35 bbl.

Climax pool: Elmer Beeler 1 Holmes, NW SW NE 7-27-11, dry, T.D. 1,280 ft.

Wildcat: C. E. Ash, 1-B Taylor, NW NE NW 7-27-12, dry, T.D. 1,880 ft., show oil 1,876 ft., est. 500,000 cu. ft. gas 1,762 ft., Mississippi 1,755 ft.

Harvey County

Burrton pool: Carl Hipple 2 Howell, N½ SW NW 17-23-3w, flowed 306 bbl., Mississippi 3,349-67 ft.

McPherson County

Roxbury pool: Stelbar 4 Jones, S½ NE NW 19-17-1w, pumped 49 bbl., Mississippi lime 2,686-3,703 ft.

Vogts pool: Kiowa Drilling and Comanche Oil 1 Vogts, C NW SW 8-20-1w, dry, T.D. 3,012 ft., Lansing 2,370 ft., Mississippi 3,010 ft.

Pratt County

Cairo pool: Skelly 1-B Goyen, SE NW NW 17-28-11w, flowed 1,208,000 cu. ft. gas, Viola 4,263-95 ft.

Reno County

Wildcat: Cities Service 1 Crandall, NW SW NE 23-23-10w, dry, T.D. 3,964 ft., fair porosity 3,791-95 ft., Lansing 3,279 ft., Mississippi lime 3,598 ft., base Mississippi 3,655 ft., Viola 3,786 ft., Arbuckle 3,960 ft.

Zenith pool: Landon 2 Union Central, N½ SW SW 7-24-10w, flowed 31 bbl. 6 hr., Misener 3,723-28 ft., T.D. 3,787 ft.

Rice County

Keesling pool: Sam Schneider 1 Amy, W½ SW NE 9-20-9w, pumped 537 bbl., Arbuckle 3,226-56 ft.

Russell County

Trapp pool: Shell 4 Sellens, NE NW SW 33-15-13w,

swabbed 183 bbl. in 3 hr., Arbuckle 3,343-50 ft.
Cities Service 6-D Tittel, N½ S½ NE 14-15-14w, pumped 39 bbl. oil and 405 bbl. water, Lansing 3,118-21, 3,265-69 ft., T.D. 3,349 ft.
Greenvale pool: Cities Service 1 Kepka, S½ SW NW 33-14-12w, dry, T.D. 3,215 ft., stains 2,917-30 ft., Lansing 2,884 ft., sand 3,179 ft., Arbuckle 3,209 ft.

Rush County

Albert pool: Schermerhorn 3 Gisick, S½ S½ SE 25-18-16w, pumped 178 bbl., La Motte sand 3,564-75 ft.

Sedgwick County

Goodrich pool: L. W. Prunty 2 Lennery, E½ NE SE 17-25-1, dry, T.D. 3,345 ft., Mississippi lime 2,996 ft., dolomite 3,333 ft.
Stitt pool: G. A. Fuller 1 Stitt, S½ SE NE 21-27-1w, deepened to 3,667 ft., T.D., dry, base Kansas City 2,875 ft., Mississippi 3,228 ft., Simpson 3,587 ft., Arbuckle 3,662 ft.
Wildcat: Olson Oil 1 Macredie, N½ NE NE 15-29-2w, dry, T.D. 3,576 ft., acid, swabbed 3 bbl. oil an hr., Topeka 1,937 ft., Lansing 2,929 ft., Mississippi 3,547 ft.

Stafford County

Riley pool: Shell 1 Allen, SW SW NE 29-23-11w, dry, T.D. 3,766 ft., Fort Riley 1,745 ft., Topeka 2,852 ft., Lansing 3,335 ft., Viola 3,651 ft., Simpson 3,702 ft., Arbuckle 3,758 ft.
Zenith pool: Phillips 3 Tretbar, S½ NE NW 12-24-11w, flowed 300 bbl. 7 hr., Viola 3,719-66 ft.
Stanolind 3-A Ferris, W½ NE SE 15-24-11w, swabbed 7 bbl. an hr., Viola 3,808-30 ft.
Max pool: Alma Oil 1 Mellies, W½ NW SW 36-21-12w, recompleted, 12 bbl., Lansing 3,354-62 ft., T.D. 3,576 ft.

KANSAS DRILLING REPORT

Barton County

Jones Bros. 1 Grizzell.....N½ NW NE 33-16-12w
First report.
C. Piggott et al 1 Beran..... E½ NE NE 24-17-12w
Lansing 3,045 ft., 7-in. 3,050 ft., drilling 3,080 ft.
Isern Bros. 1 Lillard.....W½ SW SE 6-16-11w
8-in. 63 ft.
Fred Steckel 1-A fee.....S½ SW NE 11-20-12w
8-in. 105 ft., anhydrite 695 ft., drilling 2,031 ft.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Jan. 25	Jan. 18
Burrton	8,100	7,950
Ritz-Canton	4,250	4,150
Graber	2,350	2,550
Hollow-Nikkel	1,450	1,400
Voshell	1,750	1,800
Wellington	1,350	1,300
Lorraine	800	1,350
Stoltenberg-Wilkins	5,210	5,240
Bloomer	5,300	4,700
Chase	5,400	5,350
Geneseo	3,200	4,450
Silica	17,800	17,550
Wherry	3,500	3,400
Trapp district	18,200	15,400
Balance Russell County	20,050	20,550
Sedgwick County	3,150	3,200
Bemis	10,250	9,100
Burnett	7,050	6,900
Kingman County	1,180	1,155
Stafford County	10,715	11,375
Greenwood County	8,050	8,250
El Dorado	6,850	6,950
Total Kansas	199,400	199,200

Cowley County

Don Young 1 Lantz.....NE NW SW 14-34-3e
S.D. 800 ft.
Sinclair Prairie 1 Gibson.....SE SE NW 29-34-3e
10-in. 2,200 ft., Kansas City 2,645 ft., S.D. 2,656 ft.

Ellsworth County

Pryor & Lockhart et al 1 Weisenthal.....
SW SE NE 30-15-10w
Anhydrite 546 ft., 13-in. 550 ft., S.D.

Graham County

Ewers-Simpson et al 1 Bundy.....SW SW 12-9-22w
Anhydrite 1,817 ft., drilling 2,480 ft.

Greenwood County

Aikman & Braden 1 Sasse.....NW NE SW 36-23-13e
T.D. 1,753 ft., pumped 3 bbl. oil and 75 bbl. water per day.

Reno County

R. E. Hess 1 McKee.....E½ NE SE 8-22-8w
12-in. 273 ft., drilling 815 ft.

Rice County

Bunting-Dowling & Skow 1 Mantz.....
W½ SW NE 17-19-10w
Drilling 2,890 ft.

Russell County

Earl Wakefield 1 Holland.....E½ NE SE 30-13-13w
12-in. 415 ft., anhydrite 804 ft., drilling 805 ft.

Stafford County

Earl Wakefield 1 Prescott....W½ NW SW 32-23-14w
10-in. 164 ft.
Fain 1 Thole.....E½ SE SE 23-21-12w
Topeka 2,825 ft., drilling 2,940 ft.
Landon & Faulkner 1 Shaeffer..W½ NW SW 3-21-13w
First report.

FOREST CITY BASIN

ST. JOSEPH, Mo., Jan. 26.—The Ohio Oil Co. was drilling cement plug at the close of the week at 6 Sandrock in SW NW NE SE 20-1n-16e, in Falls City pool. This week is slated to be producer No. 31 for the pool. There are not actually 31 producers, however,

(Continued on Page 218)

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THERE'S A DISTRIBUTOR NEAR YOU

Panoche District Pool Found After Extensive Exploration

By

L. P. STOCKMAN

LOS ANGELES, Calif., Jan. 27. — Jergins Oil Co., headed by Allan T. Jergins who has experienced considerable success during the past 25 years in several California fields, notably Long Beach, appears to have found an accumulation of oil and gas in the Panoche district of Fresno County although the importance of this field will remain conjectural pending additional development. The substantial decline shown by the well within a few days following completion either indicates that sand is interfering with production or the volume of gas present is substantially smaller than first reports indicated. The discovery well, 2 Cheney, in 29-14s-13e, is located on a 5,500-acre ranch approximately 33 miles west of Fresno and about 12 miles southwest of Mendota. No. 2 Cheney has been officially completed flowing 125 bbl. of 50-gravity oil and 1,125,000 cu. ft. of gas initially from the Cretaceous. Bottom of the hole is 7,355 ft., plugged to 7,277 ft.

The discovery well is the second attempt of this company to develop commercial production in the Panoche Creek district of Fresno County as initial work of Jergins Oil Co. started in November 1939, when 1 Cheney was spudded 330 ft. south and 330 ft. east of the west quarter corner of 29-14-13. The company, after abandoning 1 Cheney, moved southeast for No. 2 and built the derrick 330 ft. north and 990 ft. east of the SW cor. 29-14-13. No. 2 has 78 ft. of Cretaceous and is about 57 ft. higher structurally than No. 1. Officials of Standard Oil Co. flew down from San Francisco on two occasions and, while no definite announcement has been made, it is generally assumed that Standard Oil Co. is one of several contributors of dry-hole money for the drilling of No. 2. Acreage in this section of the San Joaquin Valley is held in large blocks and development work will accordingly be along conservative lines.

Wildcat operations of Jergins in the Panoche district of Fresno County are of prime importance because 1 Cheney is the first well started in California through the use of soil gas to determine the probable existence of an accumulation. This section of the San Joaquin Valley has been subjected to several seismograph surveys in past years but results of shooting have not been any too satisfactory. About 20 miles southeast of the Panoche district, Western Gulf Oil Co., Texas Co., and other operators have found structural highs at several points in the Cantua Creek section of Fresno County by reflection seismograph work but drilling operations have failed to reveal anticipated structural conditions. Because of this, it was decided to make a soil-gas analysis and this method showed such satisfactory indications in the Panoche Creek district that Jergins Oil Co. proceeded with exploration work. It is interesting to note that Western Gulf Oil Co., Texas Co., Mohawk Petroleum Co., and other operators who have drilled in the Cantua area have generally hung up tools after finding the Domengine, middle and lower Eocene, barren.

Jergins 1 Cheney was carried down to 9,225 ft. but was later plugged back and redrilled to 7,350 ft. and suspended at that point because of the failure of the well to produce. The base of the Etchegoin (Pliocene) was logged at 3,122 ft., top of the Kreyenhagen (Oligocene) was cored at 3,520 ft., top of the Domengine (Eocene) was found at 4,460 ft., and base of the Domengine was logged at 4,820 ft. Top of the Moreno, upper member of the Cretaceous, was logged at 6,118 ft. The productive member of the Cretaceous is found about 1,100 ft. below top of the Moreno. The implication resulting from completion of No. 2 as a flowing well in rocks of Cretaceous age, despite the fact that production declined subsequently to about 10 bbl. of condensate and 500,000 cu. ft. of gas daily, is that the Cretaceous should prove productive elsewhere in the state.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: San Joaquin Valley	9	10,091	60,074
Coastal district	2	1,118	14,286
Los Angeles Basin	8	1,699	37,539
Dry holes: San Joaquin Valley	2	.....	6,800
Total	21	.....	118,699

AVERAGE DAILY PRODUCTION

LEADING CALIFORNIA FIELDS

	Jan. 25	Jan. 18
Wilmington	82,925	81,825
Midway-Sunset	46,600	55,575
Long Beach	41,825	41,630
Kettleman North Dome	38,950	39,880
Ventura Avenue	31,725	32,990
Coalinga	31,400	32,930
Huntington Beach	26,950	27,220
Santa Fe Springs	23,750	25,360
Santa Maria Valley	21,375	21,115
Dominguez	21,150	19,497

A small amount of Cretaceous production was developed at the north edge of the West Coalinga district a number of years ago and the oil produced was of a very light gravity, averaging around 50 gravity. Discovery of small Cretaceous production in the Panoche district was therefore not totally unexpected inasmuch as these areas are not very far apart geographically.

Paloma

A committee sponsoring unification of operations in the future drilling and production of the Paloma distillate field has met with considerable success but the discovery of a new oil zone above that originally found and produced has had a tendency to hold up the unanimous approval required. This is particularly true of lessors as the approved agreement must be ratified both by operators and landowners alike. The new zone which is located above the original Paloma zone is also a distillate pay and does not change the picture as far as can be seen although it may cause a revision depending upon the extent of zone. This new pay was found in Western Gulf 12-12-B K.C.L. almost a mile east of present production. It is a new oil sand cored at 10,270-10,396 ft. and is found above the chert marker.

SAN JOAQUIN VALLEY COMPLETIONS

Canal Field

Ohio 3-E Kern County Land 14-30s-23e
Flowed 1,489 bbl., 36.7 gravity, 1.3 per cent cut, 2,155,000 cu. ft. gas, 56/64-in. bean. Pressures 250/1,175 lb. Elev. 327 ft. T.D. 8,340 ft. 7-in. water string 8,095 ft. 275 ft. 4¾-in. liner 8,338 ft. Perf. 8,100-8,338 ft. 8,326 ft. 2½-in. tubing. Originally completed in 1937 at 8,175 ft. Deepened to 8,340 ft. Completed in equivalent of Stevens zone. Kern County.

Coalinga Northeast Field

Standard 78-19-B fee 19-19s-16e
Flowed 2,544 bbl., 25.1 gravity, 0.9 per cent cut, 1,324,000 cu. ft. gas, 45/64-in. bean. Pressures 730/1,015 lb. Elev. 595 ft. T.D. 8,195 ft. 7-in. water string 8,164 ft. 68 ft. 5-in. liner 8,194 ft. 60-mesh perf. 8,164-94 ft. 8,162 ft. 2½-in. tubing. Potential established on 3-hr. test. S.I. pressure 1,250/1,250 lb. 70 days from spud to completion. Top Kreyenhagen 6,960 ft., green sand 8,078 ft. Gatchell oil sand 8,164-95 ft. Fresno County.

Coalinga Southeast Field

E. L. Cord 1 Coalinga 6-20s-16e
Flowed 1,050 bbl., 29.1 gravity, 0.7 per cent cut, 650,000 cu. ft. gas, 12/64-in. bean. Pressures 1,100/1,150 lb. Elev. 691 ft. T.D. 8,262 ft. 7-in. water string 8,248 ft. 21 ft. drillable 5-in. liner 8,262 ft. Perf. 8,252-62 ft. 8,226 ft. 2½-in. tubing with bottom-hole bean at 8,176 ft. Completed in Gatchell sand (Eocene). 143 days from spud to completion. Top Kreyenhagen 6,999 ft., green sand 8,168 ft. Gatchell 8,205-62 ft. Initial production based on 4-hr. test. Fresno County.
Standard 82-19-F fee 19-20s-16e
Flowed 245 bbl., 32.4 gravity, 0.7 per cent cut, 116,000 cu. ft. gas, 32/64-in. bean. Pressures 225/650 lb. Elev. 682 ft. T.D. 7,787 ft. 7-in. water string 7,764 ft. 44 ft. 5-in. liner 7,785 ft. Perf. 7,765-85 ft. 7,750 ft. 2½-in. tubing. Top Kreyenhagen 6,503 ft., green sand 7,646 ft. Gatchell oil sand 7,765-87 ft. 85 days from spud to completion. Fresno County.

Kern River Front Field

Western Mesa Oil Co. 5 Kern County Land 11-28s-27e
Pumped 35 bbl., 13.5 gravity, 1 per cent cut. Elev. 965 ft. T.D. 1,970 ft. 9-in. water string 1,685 ft. 278 ft. 6⅝-in. liner 1,880 ft. Perf. 1,812-80 ft. 1,429 ft. 2½-in. tubing. Originally completed in 1938 at 1,733 ft. Base Etchegoin 1,799 ft. Oil sand 1,814-26 ft., 1,850-76 ft. Kern County.

Mount Poso Field

Ring Oil Co. 29-11 Bowles 29-26s-28e
Pumped 416 bbl., 15.6 gravity, 0.8 per cent cut. Elev. 1,134 ft. T.D. 1,813 ft. 7-in. water string 1,805 ft. 66 ft. 5-in. liner 1,813 ft. 120-mesh perf. 1,791-1,813 ft. 1,619 ft. 3-in. tubing. Completed in Vedder zone. Top of oil sand 1,790 ft. Bottomed in oil sand. Kern County.

Panoche Field

Jergins Oil Co. 2 Cheney ranch 29-14s-13e
Flowed 125 bbl., 55.1 gravity, 5 per cent cut, 1,125,000 cu. ft. gas. 1-in. bean. Pressures 250/500 lb. Elev. 399 ft. T.D. 7,355 ft. P.B. 7,280 ft., replug 7,277 ft. 7-in. water string 7,200 ft. 111 ft. 5-in. liner 7,277 ft. Perf. 7,187-7,277 ft. 7,100 ft. 2½-in. tubing. Fresno County.

Potrero Hills District

Richfield 3 Potrero 10-4n-1w
T.D. 3,800 ft. Abandoned. Formation test 3,590-3,652 ft. Solano County.

Rumsey Hills District

Standard 1 Tippetts 9-12n-3w
T.D. 3,252 ft. Abandoned. Yolo County.

Ten Section Field

Shell 76-30-A Kern County Land 30-30s-26e
Flowed 1,938 bbl., 33.7 gravity, 2 per cent cut, 630,000 cu. ft. gas. 38/64-in. bean. Pressures 125/400 lb. Elev. 326 ft. T.D. 8,210 ft. 4¾-in. oil string 8,207 ft. Perf. 7,967-8,207 ft. 7,930 ft. 2-in. tubing. Completed in Stevens (Miocene). Drilled by slim-hole drilling method. 23 days from spud to completion. Stevens oil zone 7,780-8,210 ft. Kern County.

Tupman Field

Richfield 41-33-A Kern County Land 33-30s-25e
Flowed 2,249 bbl., 32.6 gravity, 1.1 per cent cut, 2,300,000 cu. ft. gas. Two 1½-in. beans. Pressures 350/250 lb. Elev. 316 ft. T.D. 9,225 ft. 8½-in. water string 8,645 ft. 582 ft. 6⅝-in. liner 9,220 ft. Perf. 8,682-6,783 ft., 8,821-9,026 ft., 9,064-9,218 ft. 9,192 ft. 2½-in. tubing. Completed in equivalent of upper and lower Stevens (Miocene). 62 days from spud to completion. Kern County.

SAN JOAQUIN VALLEY OUTPOSTS

Coles Levee Field

Standard 20-8 Kern County Land 5-31s-25e
T.D. 8,950 ft. in Stevens oil sand. Top 8,890 ft. 8⅝-in. casing at 8,880 ft. Kern County.
Union 58-2 Kern County Land 2-31s-25e
Drilling 9,801 ft. in sandy brown shale. Kern County.

Elk Hills Field

Standard 42-31-S 31-30s-24e
T.D. 4,994 ft. Redrilling 4,791 ft. to straighten hole. Kern County.

Kettleman North Dome Field

Standard 1-1-U fee 1-23s-16e
6⅝-in. casing 10,865 ft. Kings County.

Midway-Sunset Field

No. Amer. Consd. 1-28 W.P. 28-32s-23e
Drilling 5,080 ft. in hard shale with streaks of impervious sand. Kern County.

Paloma Field

Western Gulf 12-12-B Kern County Land 12-32s-26e
Drilling 10,400 ft. in hard sandy shale. Still above the chert which occurs above productive Stevens zone. Cored good looking oil sand and shale 10,270-10,396 ft. This is first time this oil sand has been cored at Paloma. Kern County.

Rio Bravo Field

Union 41-33 Pacific States 33-28s-25e
Drilling 11,398 ft. ahead in sandy shale. Cemented 7-in. casing 11,398 ft. Kern County.

Strand Field

Associated 25-7-E Kern County Land 7-30s-26e
Drilling 11,395 ft. in hard chert. Kern County.

Wheeler Ridge Field

Richfield 2 Kern County Land 28-11n-20w
Coring siltstone 11,465 ft., T.D. Kern County.

SAN JOAQUIN VALLEY WILDCATS

Cantua Creek District

Texas 27-13 Southern Pacific 13-17s-15e
Drilling 316 ft., surface formations. Fresno County.

Buena Vista Hills District

Honolulu 25-P fee 10-32s-24e
Drilling 10,770 ft., hard tight brown shale. Kern County.

Buttonwillow District

Texas 47-15 Southern Pacific 15-29s-24e
Drilling 1,867 ft., sand and shale. Kern County.

Rio Bravo District

Wilshire 1 Campen 1-29s-25e
T.D. 11,445 ft. in Vedder oil sand. Completing. On water-shutoff test well began flowing gas and 34-gravity oil. Kern County.

Tejon District

Richfield 1 Tejon ranch 2-10s-19e
Drilling 9,798 ft., gray sand and shale. Kern County.

LOS ANGELES BASIN

The most important development in Los Angeles Basin during the past week was the sudden change in the outlook of 1 Smith, an outpost located in the extreme northwestern end of the Inglewood field. This well, originally started by Federal Oil Co. but recently taken over by R. R. Bush Oil Co. for the purpose of deepening it to the Sentous zone, has shown considerable encouragement during the past several days. For more than a week the R. R. Bush Oil Co. has been fighting heavy gas pressure. The hole is at present being cored slowly. The strong gas pressure was encountered in a drilling break at 7,950 ft. and the ditch shows considerable oil along with the gas. Top of the Nodular shale was logged at 7,865 ft. This same Nodular shale was cored in Bush 1 Sentous in the extreme southwestern end of the structure and thus with the logs running so close the outcome of work on 1 Smith should be watched very closely by those interested in deep drilling in the Inglewood field. In the southwestern end of the Inglewood field where Standard Oil Co. is drilling an offset to 1 Sentous no changes of consequence occurred during the week. No. 3-1 Los Angeles Investment is bottomed in a sandy shale at 8,922 ft. but the company found the hole slightly off vertical and the crews have been reaming to straighten the hole before proceeding with additional work.

Long Beach

Union Oil Co. will probably be ready to make a production test of 19 Long Beach Community within another week or 10 days and this deep well is expected to start a small but aggressive deepening campaign on properties adjacent to the well. Texas Co., Richfield Oil Corp., Shell Oil Co., Inc., and other operators are removing all debris on their respective leases and are strengthening some of the wooden derricks that have been standing since original completion of drilling. Replacement of new wood in many of the derricks north of Union 19 Long Beach Community evidently indicates that some operators contemplate using the wooden derricks that have been standing for several years. Two of the four deep tests that have been drilled in the Long Beach field up to the present time have used wooden derricks with success. Hilldon Oil Co. recently resumed development work on its acreage out on the northern edge of the Cerritos section of the Long Beach field and is making hole in 1 Bixby Pool a little below 5,200 ft. The company recently recompleted 4 Flood Control pumping 200 bbl. of 25.6-gravity oil daily after deepening the hole from 4,565 ft. to 5,419 ft.

Wilmington

The large number of new rigs erected and locations staked in the Wilmington field indicates that this district may experience a busy period during the next few months. This is particularly true of Union Pacific Railroad Co. which has seven new derricks standing and foundations going for two more. This is in addition to six strings of tools in operation. Long Beach Oil Development Co., which is developing several properties for the city of Long Beach, has three wells making hole and derricks up or in course of construction for four additional wells. The Continental Corp., which has been developing a long narrow strip comprising the west bank of the Los Angeles County Flood Control Channel, has one derrick standing, another in course of construction, and one additional location staked. This company employs directional drilling in order to spot the bottom of each hole beneath the Flood Control Channel and results to date have been of outstanding importance. It is believed quite probable that the total number of wells in the Wilmington field may reach 975 before the close of 1941 and if this proves true the field will probably have a total of 1,200 wells upon conclusion of Ford zone development in the Long Beach Harbor section of the field.

LOS ANGELES BASIN COMPLETIONS

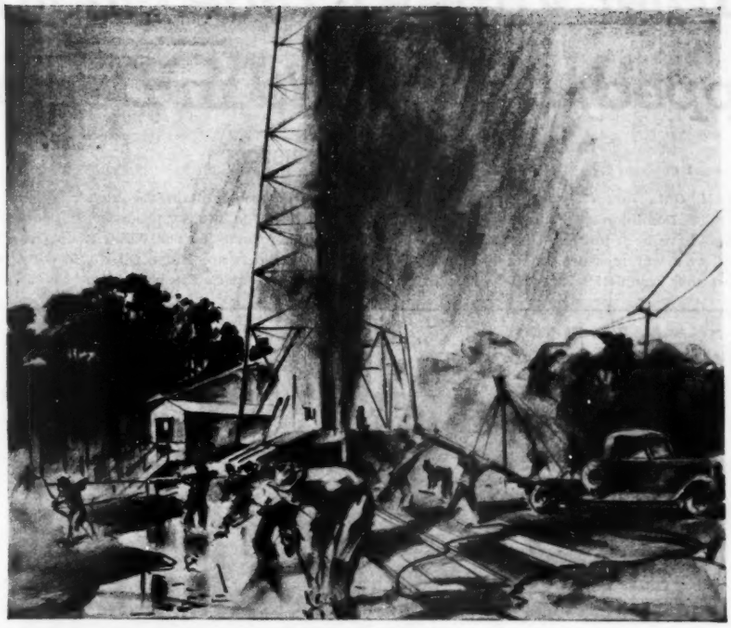
Huntington Beach Field

Clear View Oil Co. 2 Williams 36-5s-11w
Pumped 75 bbl., 17.4 gravity, 4 per cent cut. Elev. 60 ft. T.D. 4,255 ft. 7-in. water string 4,174 ft. 125 ft. 6⅝-in. liner 4,255 ft. Perf. 4,165-4,225 ft. 4,190 ft. 2½-in. tubing. Completed in Pliocene. 37 days from spud to completion. Orange County.

Long Beach Field

Treadwell Corp. 1 Signal 30-4s-12w
Pumped 35 bbl., 23.6 gravity, 50 per cent cut. Elev. 110 ft. T.D. 4,620 ft. 7-in. oil string 4,610 ft. Perf. 4,320-35 ft., 4,415-65 ft., 4,490-95 ft., 4,505-4,600 ft.

(Continued on Page 222)



BLOWOUT WELL *from a lithograph by E. M. Schiwetz*

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Turner Valley Crude Quotas Upped; New Yield in Demand

By VICTOR LAURISTON

CHATHAM, Ont., Jan. 27.—At the request of G. R. Cottrelle, Dominion oil controller, Turner Valley crude quotas have been increased from 22,000 to 25,000 bbl. a day, as a war measure, effective January 18. It is expected that completion of new wells will enable the field to maintain the higher output. In the new schedule, the largest producer is Foothills Oil & Gas No. 5, in North Turner Valley, with 664 bbl. Other major producers are Home Oil No. 5, with 599 bbl.; Foothills No. 7, with 551 bbl.; Home No. 2, with 522 bbl.; Royalite Oil No. 48, with 456 bbl.; Calmont-Northwest No. 2, with 450 bbl.; Home Oil No. 3, with 445 bbl.; Anglo-Canadian Oil No. 7, with 419 bbl., and Arrow Royalties No. 2 and Twin Valley Syndicate No. 1, with 400 bbl. each. There are 131 wells listed in the schedule.

Steveville Producer

In the Steveville field, east of Calgary, Standard of British Columbia 1 Princess, LSD 3, 13-20-12w4, originally finished in the Devonian lime at 4,250 ft. and plugged back to 3,325 ft. to test the Madison, is definitely a large producer. The 7-in. production string was cemented at 3,220 ft. The well started with 168 bbl. a day natural production from an 80-ft. zone, gradually increasing to a rate of 381 bbl. After a light acid treatment of 250 gal. it flowed at the rate of 883 bbl. a day on a 4-hour test. It was then shut in and treated with 750 gal. Later an 8-hour test through 1-in. choke gave a rate of 521 bbl. a day of clean water-free crude. After all available tankage was filled, the well was shut in, pending official government test. Production is 26.3-gravity crude, accompanied by a gas flow between 12,000,000 and 14,000,000 cu. ft. a day. The well is the largest crude producer ever completed in Alberta outside Turner Valley.

Location of the new field is at Princess Siding, near Patricia, some 12½ miles northeast of Brooks and between 120 and 130 miles east of Calgary. The anticlinal structure at this point in the Red Deer Valley was first noted by Dr. G. M. Dawson as long ago as 1885, but the first extensive geological investigation was made a few years ago by Altoba Agencies and Dawson-Steveville Syndicate, under direction of Joseph S. Irwin, consulting geologist, of Calgary. These companies interested Anglo-Canadian Oil Co. and Standard of British Columbia in active development, each drilling three wells, while Anaconda Oil Co. of Calgary also started a test in the north end of the field. The earlier wells encountered large gas flows in the top of the Madison, with small shows of oil. Standard of British Columbia holds about 80,000 acres and Anglo-Canadian about 60,000; while other holders include Dawson-Steveville Syndicate, 5,000 acres; Mid-Royal Tide Lake Syndicate, 43,000 acres; Union Drilling Co., 10,000 acres; J. R. Phillips, Calgary, 10,000 acres; Royal-Canadian Oils, 20,000 acres; Rainy Hills Syndicate, 2,000 acres; Altoba Agencies, 4,000 acres; Hudson's Bay Co., 10,000 acres; F. P. Byrne, Calgary, 4,500 acres. Anaconda Oil Co. holds about 1,760 acres, with well site. The strike indicates the probability of oil in commercial quantities at numerous points on the Sweetgrass arch from the Kevin-Sunburst field in Montana to the Vermilion field in Alberta. It is some 150 miles closer to Manitoba and Saskatchewan refineries than Turner Valley. Immediate new development is expected to follow a north-south line from the Princess producer.

Standard of British Columbia will start a third test within about a month, though definite location has not been announced. It is expected that Anaconda Oil Co. No. 1, LSD 15, 9-22-12w4, standing at 4,022 ft., will be deepened, or a new test started. Anglo-Canadian Oil Co. No. 4 will also be started this winter or spring.

Turner Valley Lime Tests

North Turner Valley: Home Oil 1, LSD 8, 33-20-3w5, finished at 8,010 ft., making official test. Home Oil 6, LSD 8, 28-20-3w5, finished at 8,446 ft., making official test.

West Central field: Royalite Oil 53, LSD 4, 19-19-2w5, below 7,507 ft., after getting the Madison at 7,232 ft. Royalite 54, LSD 1, 7-19-2w5, finished at 7,367 ft., acidizing and testing.

Southwest field: Commoil 4, LSD 9, 29-18-2w5, finished at 7,308 ft., has initial allowable of 161 bbl.

New Tests Starting

North Turner Valley: Atlas-British Dominion 2, LSD 4, 17-21-3w5, most northerly test in the field, working on derrick.

Major Oils 3, LSD 1, 8-21-3w5, has spudded and is below 170 ft. Major 2, LSD 12, 4-21-3w5, rigging. Ace Royalties 1, LSD 5, spudded and below 113 ft.

Royalite Oil 56, LSD 12, 14-20-3w5, working on derrick.

West Central field: Southwest Petroleums 5, LSD 2, 8-19-2w5, spudded, below 495 ft.

Royalite Oil 55, LSD 7, 7-19-2w5, working on cellar.

Blood Reserve Test

On the Blood Indian Reserve west of Lethbridge,

(Continued on Page 209)

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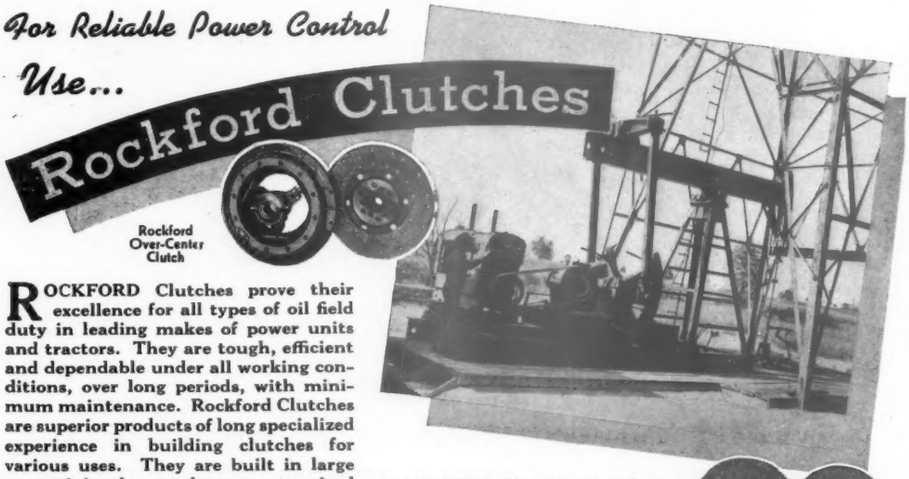

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Wildcat Play Follows Field Growth at Olla and Nebo

By GEORGE WEBER

SHREVEPORT, La., Jan. 27.—The one-hundredth oil well was completed in the Olla field, La Salle Parish, during the past week, pointing the importance of the Wilcox play in North Louisiana. Olla and Nebo, the two oil fields now producing, have seen steady development since their discovery in 1940. In addition a wildcatting campaign, following Olla's discovery, has gained momentum. Tests in Caldwell, La Salle, Grant, Madison and Tensas parishes are now active, and others are scheduled throughout the play.

Two wildcats were begun this week; Siers et al 1 Herring, in La Salle Parish, just northeast of Jena, and H. L. Hunt 1 Lancaster on the southern edge of Madison County, south of Tallulah. In addition, Pope & Shields have set surface casing in 1 Panola Co., in Tensas Parish, north of St. Joseph, and two Caldwell Parish wildcats are drilling, D. J. Crawford 1 Louisiana Central east of Clarks and V. V. Ryan 1 Louisiana Central near Copenhagen.

In Claiborne Parish C. H. Lyons et al 1-A Lloyd, a former Pettit producer at Lisbon, was deepened to the Travis Peak of Hosston formation in search of the oil sand discovered just below the Pettit last year. The well was carried from 5,223 ft. to 5,395 ft. without encountering the sand, and will either be plugged back and completed in the Pettit or abandoned.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
North Louisiana			
Oil wells: Sugar Creek	1	1,029	5,807
Olla	5	966	11,442
Nebo	1	150	4,014
Gas wells: Monroe	3	7	6,615
Dry holes: Standard	1	.....	2,406
Total	11	.....	30,284
Arkansas			
Oil wells: E. El Dorado	1	120	3,300
Urbana	1	110	3,335
Dry holes: Wildcats	1	.....	1,732
Total	3	.....	8,367
East Texas Border			
Oil wells: Smithland	1	19	2,350

Deep Test Is Coring

F. B. King et al have spudded 1 King, ½ mile west of Pettit production at Lisbon, and are drilling below 3,000 ft. North of Lisbon the deep Union Producing Co. 1-A Meadows is coring in lime below 10,966 ft., currently the deepest test in North Louisiana.

In the nearby Athens field, Skelly Oil Co. and Sunray Oil Co. are testing 1 Valentine, which has proven gas-condensate production in two horizons. The test last week made 25 bbl. of condensate and 7,000,000 cu. ft. of gas through a 20/64-in. choke on a 24-hour gage. The liquid condensate has a gravity of 67.5, but is dark in color.

W. G. Ray Drilling Co. 1 Noel estate is drilling below 8,000 ft. after failing to find production shows in the Cotton Valley, topped at 6,410 ft. This is the second deep test at Pine Island, considered one of the major deep-seated structures in North Louisiana, and once highly regarded as a deep prospect.

NORTH LOUISIANA COMPLETIONS

Sugar Creek—Claiborne Parish

Union Producing 3 Carter.....SE SE 32-20-5w 1,029 bbl., 28/64-in. choke, T.P. 550 lb., C.P. 1,100 lb., 5½-in. casing 5,781 ft., perf. 5,720-34 ft. and 5,743-57 ft., T.D. 5,807 ft.

Standard—La Salle Parish

Allen Breedlove Oil & Gas 1 Powell....SE SW 32-11-3e T.D. 2,406 ft., dry.

Olla—La Salle Parish

Arkansas Fuel Oil 1-B Harris.....SW NE 30-10-3e T.D. 2,219 ft., 150 bbl., 10 per cent salt water, 12/64-in. choke, T.P. 125 lb., C.P. 175 lb., 7-in. casing 2,219 ft., perf. 2,193 ft., upper Central sand.

Arkansas Fuel Oil 1-B Nugent.....NE SW 24-10-2e 168 bbl., 5 per cent salt water, 12/64-in. choke, T.P. 150 lb., C.P. 250 lb., 7-in. casing 2,235 ft., perf. 2,200-10 ft., Wilcox, T.D. 2,235 ft.

Arkansas Fuel Oil 10-C Tremont ..... SW NE 3-9-2e 144 bbl., 3 per cent salt water, ¼-in. choke, T.P 560 lb., C.P. 800 lb., 7-in. casing 2,249 ft., reperf. 2,243-48 ft., Wilcox, T.D. 2,249 ft.

Placid Oil 41 La. Central.....NW NE 36-10-2 204 bbl., 6 per cent salt water, 14/64-in. choke, C.P. 480 lb., T.P. 120 lb., 7-in. casing 2,393 ft., perf. 2,240-44 ft., Wilcox, T.D. 2,393 ft.

Placid Oil 80 La. Central.....SW SE 13-10-2 300 bbl., 55 per cent salt water, 20/64-in. choke, T.P. 80 lb., C.P. 400 lb., gas lift, 7-in. casing 2,424 ft., perf. 2,238-44 ft., Wilcox, T.D. 2,426 ft.

Nebo—La Salle Parish

Hunt Oil 8-A Goodpine .....SE SE 8-7n-3e 150 bbl., 12 per cent salt water, 14/64-in. choke, 7-in. casing 3,948 ft., perf. 3,706-10 ft., T.D. 4,014 ft., Wilcox.

Monroe—Morehouse Parish

Southern Carbon 36 Tensas ..... NE 22-22-4 2,000,000 cu. ft. gas, R.P. 890 lb., T.D. 2,218 ft., 6-in. casing 2,136 ft.

Monroe—Union Parish

Interstate Nat. Gas 104 fee ..... SE SE 27-22-3e 1,000,000 cu. ft. gas, R.P. 910 lb., T.D. 2,200 ft., 6-in. casing 2,110 ft.

N. & W. Corp. 1 Bryan ..... N½ NE SW 28-20-3e 4,000,000 cu. ft. gas, R.P. 970 lb., T.D. 2,197 ft., 7-in. casing 2,112 ft.

NORTH LOUISIANA DRILLING REPORT

Caddo Parish

W. G. Ray 1 Noel ..... SE 30-21-14 Drilling 8,056 ft.

Caldwell Parish

D. J. Crawford et al 1 La. Central .....SE SW 30-12-4e 8⅝-in. casing 210 ft., coring 2,258 ft.

V. V. Ryan 1 La. Central.....NE NE 16-12-4e Drilling 2,477 ft.

Claiborne Parish

C. H. Lyons et al 1-A Lloyd ..... SE SW 2-20-5w (Deepened Lisbon test), old T.D. 5,223 ft., drilled to 5,395 ft., no show.

Skelly and Sunray 1 Valentine .....NW NW 31-20-6w Testing, flowing gas and condensate, T.D. 6,018 ft., old T.D. 6,507 ft.

Union Producing 1-A Meadows.....NE 18-21-4 Coring lime 10,966 ft.

De Soto Parish

J. E. Stack et al 1 Cook .....NW NE 32-13-14 S.D. 3,000 ft.

Grant Parish

Bering Oil 1 Goodpine ..... SW NE 18-8n-1w S.D. 4,174 ft., no shows.

La Salle Parish

Spiers et al 1 Herring ..... SE SW 1-8-3e First report.

Madison Parish

H. L. Hunt 1 Lancaster, 385 ft. W, 340 ft. N most easterly cor. 3-14-12, first report.

Natchitoches Parish

J. E. Watts 1 Tanner.....SW SW NW 18-10-10 S.D. 3,430 ft.

Red River Parish

Thornton & La Croix 1 Prudential Life, SW SW NW 31-11-9, S.D. 1,317 ft.

Sabine Parish

Roy Raines 1 Carter ..... SW NW NW 27-9-11 S.D. 2,377 ft.

J. E. Watts 1 Cook .....W½ SW NE 27-10-11 S.D. 3,435 ft.

Tensas Parish

Pope & Shields 1 Panola ..... SE NW 34-13-12 10¾-in. casing 369 ft., T.D. 380 ft.

Union Parish

Walter B. Reineck 4 Hudson.....NW SE SE 7-23-1e First report.

ARKANSAS

The most closely watched wildcat in South Arkansas is the Crow Drilling Co. 1 J. W. Smart, a deep test in the Stephens field of Columbia County. The Smackover lime was topped last week at 5,949 ft. On coring the top section, usually an oolitic lime, it was found that the oolites had been dissolved and the spaces which are oil bearing in the usual oolitic section were filled in forming small nonconnected pores, the matrix of an oolitic lime.

This cellular lime showed slight porosity and a slight stain and odor of oil in one core, and graded downward into a hard, tight cellular lime. Thus, although saturation is found, the cellular lime has such a low permeability that it will not give up the oil, and commercial production is not possible.

This condition has been found elsewhere in the Smackover lime of South Arkansas, notably in Lafayette County near Stamps. Total depth of the Smart well is 6,050 ft. where it is shut down awaiting orders.

AVERAGE DAILY PRODUCTION

NORTH LOUISIANA

	Jan. 25	Jan. 18
Caddo, light	6,230	5,840
Caddo, heavy	2,160	2,220
Cotton Valley	13,450	13,435
Cross Lake	3,320	3,265
De Soto and Red River	995	980
Haynesville	2,615	2,610
Homer	2,765	2,750
Lisbon	2,805	2,800
Olla	9,295	9,050
Rodessa	16,435	16,565
Sligo	2,025	2,360
Sugar Creek	1,425	1,015
Urania	2,225	2,235
Zwolle	1,350	1,350
Total North Louisiana	69,790	69,040
Rodessa, Texas	15,985	16,260

SOUTH ARKANSAS

Atlanta	2,470	2,470
Buckner	2,215	2,185
Champagnolle	1,240	1,240
Dorcheat	1,330	1,350
El Dorado	1,575	1,565
Magnolia	19,750	19,600
Nick Springs	1,200	1,150
Rodessa	1,640	1,705
Schuler	16,450	16,625
Smackover, light	1,660	1,675
Smackover, heavy	13,545	13,550
Troy	1,195	1,200
Urbana	1,700	1,675
Village	1,015	1,005
Total South Arkansas	70,005	69,965

ARKANSAS COMPLETIONS

East El Dorado—Union County

J. R. Lockhart 1 Conner ..... SE NW SE 11-17-14 Pumped 600 bbl., 20 per cent oil, T.D. 3,300 ft., 7-in. casing 2,946 ft., perf. 2,780-85 ft.

Urbana—Union County

McCreslen Oil Co. 2 K. D. Parker .. SW NE SE 3-18-13 110 bbl. oil, 220 bbl. salt water, 18/64-in. choke, C.P. 340 lb., 7-in. casing 3,328 ft., perf. 3,205-07 ft., T.D. 3,335 ft.

Wildcat—Woodruff County

John N. Watkins 1 S. Nathan.....NE NE SW 18-5n-2w T.D. 1,732 ft., dry.

ARKANSAS DRILLING REPORT

Clark County

W. S. King 1 McKenzie.....SE SE NW 30-10-19 S.D. 1,068 ft.

W. P. Wilson 1 Hamilton & Mathews..SW NW 32-10-20 S.D. 1,572 ft.

Columbia County

Crow Drlg. Co. 1 J. W. Smart.....SW SW 12-15-20 T.D. 6,050 ft., awaiting orders.

Nevada County

Coker & Grieves 1 Guy Thompson..SW SE SE 35-10-22 Topped Nacatoch 203 ft., 8¾-in. casing 25 ft.

Ouachita County

Berry Asphalt Co. 1 G. S. Martin..SW NE SW 17-14-19 S.D. 1,405 ft.

Frank J. Hughes 1 Rath & Cartier, Inc. ..... NE SW NE 35-13-18 First report.

Prairie County

Hazen Oil Co. 1 Fidelity Mutual Life Ins. Co. ..... NE NE SW 16-2n-6w Drilling shale 657 ft.

Smackover—Union County

Bob Milam 2 C. J. Childs.....NW SE NW 8-18-18 First report.

Sevier County

Gramp Oil Co. 2 Phillips ..... SW SW SW 26-9-30 10-in. casing 15 ft., drilling 549 ft.

St. Francis County

U. S. Oil Corp. 1 Wilford.....NE SE NE 29-4n-1w T.D. 2,210 ft., loosened stuck drill stem, S.D., rig repair.

Woodruff County

Tatum & Watkins 1 Miller.....SW SE SE 7-5n-2w Drilling 1,500 ft.

EAST TEXAS BORDER

Wildcatting is on the upswing in the eastern border counties of Texas. In Bowie County A. L. Willis has

(Continued on Page 222)

By
F. L. SINGLETON

Second Test Near New Orleans Spuds; Complete Pool Opener

NEW ORLEANS, La., Jan. 27.—Titanic Oil Co. 1 Marrero Land Co., a wildcat located about 12 miles west of New Orleans on the Westwego prospect, Jefferson Parish, is reported to have opened a new field for the Louisiana Gulf Coast district but details of the completion were not available at the close of the week. This well which has been generally recognized as a probable pool opener for several months in view of an attempted blowout at 9,950 ft., is bottomed in a sidetracked hole at 10,004 ft., and 5½-in. liner was cemented at that depth. Sidewall cores in a sand and shale section at 9,827-45 ft. carried an oil and gas odor, and it is assumed that the well was completed in this section.

The successful completion of this well is expected to result in an active development program, inasmuch as protection is held by several major companies and independent operators. Location is in 2-13s-23e, a farmout lease from Shell Oil Co., Inc. The well is near the Huey P. Long Bridge, and about 2,300 ft. from the Mississippi River. For the next several weeks interest in the area will be centered on Reese Carter 1 Carter located about ¼ mile east of the discovery well which was spudded during the week.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	14	4,354	119,949
Dry holes: Fields	4	.....	25,719
Wildcat	1	.....	8,245
Total	19	.....	153,904

In the Lakeside area, northwest of the Grand Lake field, Cameron Parish, Lisbon-Iberia is preparing to deepen 1 Calcasieu National Bank which showed for a large distillate producer the past week. On a 3-hour test through perforated casing at 10,050-60 ft., the well flowed at the rate of 8 bbl. of 53-gravity distillate per hour through a ¼-in. choke. Gas delivery was estimated at 5,000,000 cu. ft. per day and working pressure was 2,000 lb. At the close of the week the company was going in the hole with 3-in. drill stem to deepen from the present total depth of 10,215 ft. to approximately 10,600 ft., and if no deeper sands are encountered, the well will be plugged back and completed in the above sand section.

Deep Sand Opened at Venice

On the west flank of the Venice dome, Plaquemines Parish, Tide Water Associated Oil Co. opened the eighth oil sand for this old salt dome with the completion of 9 Buras Levee Board which flowed at the rate of 302 bbl. a day through a ⅛-in. choke. Tubing pressure was 2,175 lb. The hole is bottomed at 10,704 ft., and production was obtained by perforating casing at 10,600-60 ft., which is the deepest producing sand section opened around the flanks of the structure.

Production in the Stella field, Plaquemines Parish, was extended under the Mississippi River bed as California 1 State-Mississippi flowed at the rae of 11 bbl. per hour through a ¼-in. choke from perforated casing at 7,744-51 ft. The well is located on the east bank of the river and the hole was drilled under the river bed by directional methods.

An important extension to deep-sand production in the Iowa field, Calcasieu-Jefferson Davis Parish, was indicated as Stanolind 1 Willett, approximately 1 mile north of production is reported to have cored approximately 50 ft. of sand in the 8,200-ft. Frio section, and casing is expected to be cemented for completion.

Development along the Wilcox trend which has been inactive for the past few months gained two new operations both being located in Rapides Parish. In the Glenmora area, Lynes & Douglas were preparing to spud 1 S. Phillips in 15-1s-2w, a projected 8,500-ft. test which is being drilled on a farmout lease from California Co. Protection is held by Shell Oil Co., Inc., Gulf Refining Co., and several independent operators. In the northeastern part of the parish, Chamblee & Pitts staked location for 1 Eota Realty in 12-4n-3e.

In Vermilion Parish, about 800 ft. east of the discovery well of the Schooner Bayou field, Union Oil Co. of California 1-B School Board flowed at the rate of 3,000,000 cu. ft. of gas per day through a ¼-in. choke from perforated casing at 10,512-10,515 ft., and the well has been killed for further testing in another sand section. This is the second well drilled on the structure and the sand section was logged about normal with the discovery well.

In the South Crowley field, Acadia Parish, Humble 3 Leger, located about 900 ft. north of production, was abandoned at a total depth of 8,984 ft., and the rig is being moved to 1 Elmer Jeffers on the east side of the field in 23-10s-1e.

On the southeast flank of the Edgerly field, Calcasieu Parish, Gulf 1 Miller is being tested through perforated casing at 4,367-76 ft. This well showed indications of opening deep-sand production at 7,500 ft., but due to mechanical trouble caused by excessive gas pressure, no successful test was ever made.

LOUISIANA GULF COAST COMPLETIONS

Acadia Parish

Jennings field: Shell 13 Conover-Community, dry, T.D. 7,900 ft.

Ascension Parish

Darrow field: Humble 5-8 Community, dry, T.D. 10,013 ft.

Calcasieu Parish

Iowa field: Magnolia 16 Wait, 170 bbl., ⅞-in. choke, perf. casing 6,967-74 ft., T.D. 9,025 ft.

Cameron Parish

West Hackberry field: Stanolind 23-B School Board, 280 bbl., ⅞-in. choke, perf. casing 9,648-74 ft., T.D. 10,631 ft.

East Baton Rouge Parish

University field: Lisbon-Iberia 4 Duplantier, gas well, perf. casing 7,156-60 ft., T.D. 7,190 ft.

Evangeline Parish

Ville Platte field: Continental 3 Fontenot-Deshotels, 220 bbl., ⅞-in. choke, perf. casing 9,032-48 ft., T.D. 10,261 ft.

La Fourche Parish

Golden Meadow field: Bateman Drilling Co. 2 Hatcher, 210 bbl., ¼-in. choke, perf. casing 5,148-58 ft., T.D. 5,214 ft.

Leeville field: Texas 79 Leeville, 517 bbl., ⅞-in. choke, perf. casing 7,900-56 ft., T.D. 8,650 ft.

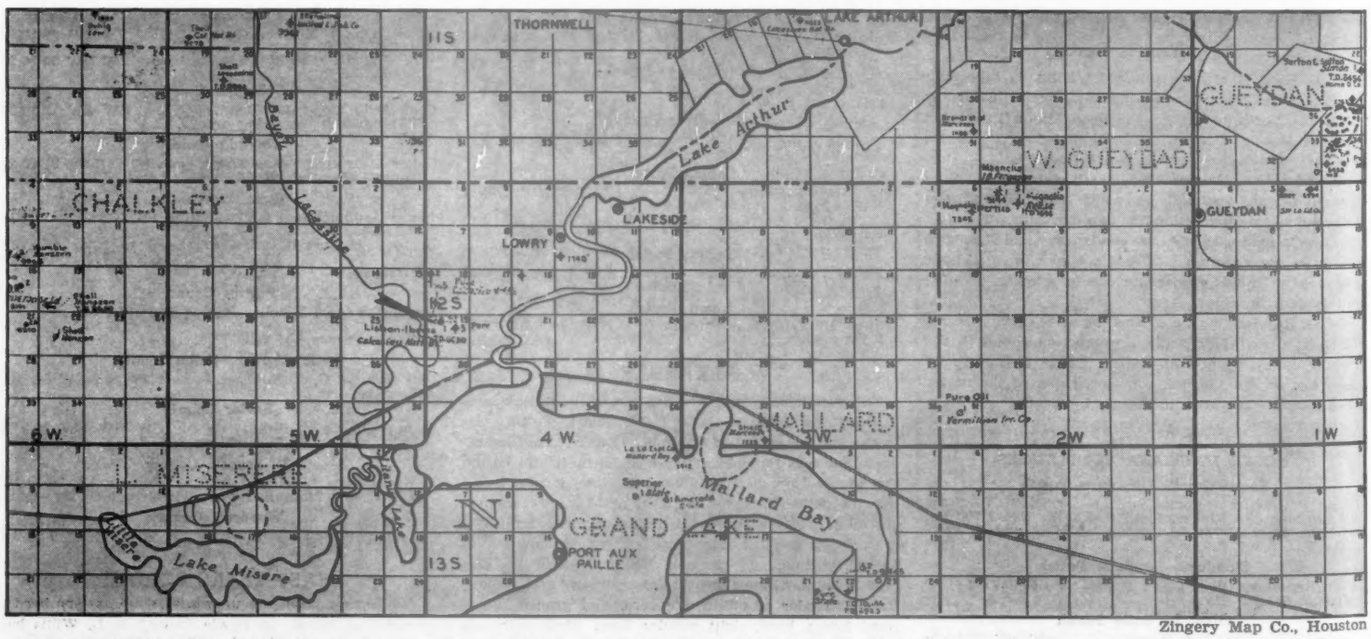
Plaquemines Parish

Stella field: California Co. 1 State-Mississippi River, 265 bbl., 5/32-in. choke, perf. casing 7,744-51 ft., T.D. 7,796 ft.

Grand Bay field: Gulf 9 State, 432 bbl., ⅞-in. choke, perf. casing 8,090-8,105 ft., T.D. 8,854 ft.

Quarantine Bay field: Gulf 4-A Plaquemines Land Co., 432 bbl., ⅞-in. choke, perf. casing 8,492-8,513 ft., T.D. 8,514 ft.

(Continued on Page 207)



Zingery Map Co., Houston

Lisbon-Iberia Oil Co. 1 Calcasieu National Bank, discovery well of the Lowry or Lakeside area, Cameron Parish, and its relation with other producing fields in the area

Old Ocean Field Is Center of Deep Drilling Campaign

By NEIL WILLIAMS

HOUSTON, Tex., Jan. 27.—Another important extension was apparently being mixed up for the Blessing gas-distillate field, Matagorda County, as Texas Co. cemented casing preparatory to testing 1 H. B. Hammond, located in the H.&G.N. Survey, approximately 4,000 ft. south of production. The hole is bottomed at 8,340 ft., and 7-in. casing was cemented at 8,330 ft. While details as to where the casing will be perforated were not available, the test is expected to be made in the discovery Frio sand section at 8,200-8,300 ft.

The east side of the Old Ocean field, Brazoria County, was being further extended as Texas Co. prepared to test 1 H. L. Walker which is bottomed at 10,991 ft., with 7-in. casing cemented at 10,988 ft. Broken sand and shale with an oil and gas odor was cored at intervals from 10,900-88 ft. Location is in the Imla Keep Survey, about 1,500 ft. northeast of the nearest production. Important extensions within the past few months have resulted in increased activity, and at the present time, with 14 active operations reported, it is the most active field in the district and represents the largest concentrated deep-drilling program ever to take place along the Gulf Coast. Companies operating include Harrison & Abercrombie, Shell Oil Co., Inc., Stanolind Oil & Gas Co., and Tide Water Associated Oil Co.

A slight southwest extension was being recorded for the South China field, Jefferson County, by Pan American 1 Community. The well is bottomed at 7,918 ft., with the top of the sand section topped at 7,876 ft., and top of the salt-water sand logged at 7,890 ft. The sand section was topped about 6 ft. lower than the company's 1 Neal, the nearest producer.

Spurger Outposts Fail

In the Spurger gas area of the Joe's Lake field, Tyler County, Republic 6 Sterne-fee is bottomed at 7,500 ft., and 5½-in. casing was cemented at 5,001 ft., preparatory to completing as a gas well in sand logged by an electrical survey at 4,918-95 ft. and 4,834-60 ft. The well is located on the north edge of the Joe's Lake field, and the electrical survey failed to show any oil or gas sands in the Wilcox formation. Oil production from the Cockfield zone in the Spurger area is limited to one well and although several attempts have been made to extend the area the completions resulted in dry-gas wells.

Increasing interest is being shown in the Chenango area, Brazoria County, as casing is being moved in to J. N. Newton Rayzor 1 J. W. Christian, a wildcat located in the William Parker Survey. The hole is bottomed at 9,510 ft. and it is assumed that casing will be cemented on bottom. The well is being drilled "tight" and it is not known whether the well will be tested at the present depth or drilled deeper.

On the north side of the Rowan field, Brazoria County, Humble Oil & Refining Co. continues to test 3 Hubbard, but the results thus far have been disappointing. After recovering salt water in a new sand section at 9,300 ft. the well was plugged back to 8,900 ft. where a drill stem recovered a small amount of cut gas. At the close of the week casing was perforated in the 8,500-ft. discovery sand and the well was reported to be showing gas and distillate. While drilling, the well cored about 12 ft. of saturated sand and the perforations in this section may have been made too high.

W. R. Davis 1 Brownston, located in the Garwood area, Colorado County, and which has been in the process of completion for the past 2 weeks, flowed 201 bbl. of fluid in 24 hours of which 65 per cent was 49.3-gravity distillate and the balance salt water. The test was made through a ¼-in. choke and tubing pressure was 1,900 lb. Shut-in casing pressure was 2,400 lb. The well was retested after a cement-squeeze job was made above and below original perforations in the Wilcox sand at 9,423-35 ft. At the close of the week these perforations were being cemented off.

Lavaca County Pool Opener Tested

M. McMurray et al 1 A. C. Allen, a prospective Wilcox sand pool opener located about 10 miles east of Hallettsville, Lavaca County, is scheduled to be tested during the week. This well is bottomed in salt-water sand at 8,523 ft., with 5½-in. casing cemented at 8,522 ft. An electrical survey showed favorable indications in a sand and shale section at intervals from 8,400-8,500 ft., but testing has been held up due to unfavorable weather conditions.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	12	3,793	79,168
Dry holes: Fields	1	.....	6,332
Wildcat	1	.....	8,258
Total	14	.....	93,758

In the La Ward area, Jackson County, Humble 1 A. A. Egg was abandoned as dry after the well failed to flow from perforated casing at 5,259-63 ft. The well was drilled to a total depth of 8,258 ft., and favorable showings of oil and gas were logged in the Frio section. It is possible that the well was located on the edge of the structure and interest in the area is now centered on the company's 1-B Mauritz, located about 1 mile to the southeast which is being spudded. About 4 miles northeast of La Ward in the Clare Survey, Crosby Drilling Co. and R. N. Ranger staked location for 1 Gayle, a 6,500-ft. test.

In the same county, and located in the Ganada field, Texas 1 Silliman, about 1,000 ft. from production, is drilling in shale below 6,154 ft. after recovering several hundred feet of pipe-line oil in a new sand section at approximately 5,790-5,800 ft. This field was opened in 1937 by the Texas Co. and approximately 12 wells have been completed as producers in the 5,000-ft. discovery sand.

TEXAS GULF COAST COMPLETIONS

Brazoria County

West Columbia field: Gulf 7 M. L. May, 593 bbl., ¼-in. choke, top sand 5,692 ft., T.D. 5,704 ft.

Chambers County

Anahuac field: Humble 46 Middleton, 689 bbl., ¼-in. choke, top sand 7,210 ft., T.D. 7,227 ft.

Hardin County

Batson field: H. B. Baker 3 Glass, 88 bbl., pumping, top sand 1,573 ft., T.D. 1,584 ft.

Harris County

Tomball field: Humble 1 Anderson, 285 bbl., ¼-in. choke, top sand 5,572 ft., T.D. 5,590 ft.

Jackson County

Lolita field: Cox & Hamon 1 Robertson, 127 bbl., ⅛-in. choke, perf. casing 5,931-33 ft., T.D. 5,937 ft.
Magnolia 5 Hinshaw, 154 bbl., 7/64-in. choke, T.D. 5,932 ft.
Mauritz field: Boyle, Coffey et al 1 Mauritz, dry, T.D. 6,332 ft.
West Ranch field: Magnolia 1 Dixon, 335 bbl., ¼-in. choke, T.D. 5,769 ft.
Wildcat: Humble 1 A. A. Egg, dry, T.D. 8,258 ft.

Jefferson County

Fannett field: Gulf 4-E Marrs McLean, 889 bbl., ¼-in. choke, top sand 8,327 ft., T.D. 8,339 ft.

Matagorda County

Bay City field: Skelly 9 Moore, 108 bbl., 7/64-in. choke, top sand 8,180 ft., T.D. 8,507 ft.
Segno field: Humble 30-Bx Kirby Lumber Co., 62 bbl., 5/32-in. choke, top sand 8,131 ft., T.D. 8,195 ft.
Humble 33-Bx Kirby Lumber Co., 372 bbl., ¼-in. choke, top sand 8,111 ft., T.D. 8,190 ft.
Humble 34-Bx Kirby Lumber Co., 91 bbl., ¼-in. choke, top sand 8,144 ft., T.D. 8,205 ft.

TEXAS GULF COAST DRILLING REPORT

Brazoria County

Phillips 1 Triangle Development, 1 mi. east of production, Chocolate Bayou field, H.T.&B. Sur., drilling shale 10,433 ft.
Rowan & Nichols 1 Mattingly, southeast of Manvel field, H.T.&B. Sur. No. 5, drilling shale 4,762 ft.
Strake 1 Griffith, southwest of Alta Loma field, H. P. Cayce Sur., drilling shale 10,257 ft.

Chambers County

Gulf 1-R 224 State, Red Fish Reef field, coring sand 10,460 ft.
Humble 8-A-223 State, Red Fish Reef field, coring shale 10,692 ft.
Humble 9-A-263 State, Red Fish Reef field, drilling sand 10,390 ft.
Humble 10-A-249 State, Red Fish Reef field, drilling sand 9,882 ft.

Grimes County

R. A. Irwin et al 1 South Texas Development Co., R. O. Lusk Sur., top Cockfield 4,478 ft., drilling shale 5,846 ft.

Harris County

George Echols et al 1 Ed. C. Smith, Cypress area, J. W. Moody Sur., junked, T.D. 7,012 ft.

Montgomery County

Superior 1 T. A. McWhorter, T. J. Nichols Sur., washing to bottom, T.D. 9,314 ft.

San Jacinto County

McDannald 1 Foster Lumber Co., Cold Springs area, G. Taylor Sur., drilling shale 6,665 ft.

Washington County

John A. Deering 1 H. C. Buck, James Lynch Sur., drilling shale 6,035 ft.

Louisiana Gulf Coast

(Continued from Page 206)

St. Charles Parish

Lake Salvador field: Texas 4 State, 527 bbl., ¼-in. choke, perf. casing 10,145-75 ft., T.D. 10,639 ft.
Paradis field: Texas 8 L. L. & E. Paradis, 320 bbl., ⅛-in. choke, perf. casing 10,275-10,320 ft., T.D. 10,490 ft.

St. James Parish

La Pice field: Shell 1 Schexnayder Community, 256 bbl., 14/64-in. choke, perf. casing 7,664-75 ft., T.D. 8,687 ft.

St. Martin Parish

Anse La Butte field: Crosby 1-A Republic Prod. Co., dry, T.D. 3,626 ft.
Stanolind 2 Rand, dry, T.D. 4,180 ft.

St. Mary Parish

Wildcat: Texas 1 State-Rabbit Island, dry, T.D. 8,245 ft.
Charenton field: Failing Exploration Co. 5 Giles-Viguerie, 25 bbl., pumping, top sand 935 ft., T.D. 945 ft.
Herton Oil Co. 1 Banta, 250 bbl., 5/32-in. choke, T.D. 10,283 ft.

Vermilion Parish

Gueydan field: Fohs Oil Co. 2 Mulvey Irrigation Co., 450 bbl., 10/64-in. choke, perf. casing 9,722-42 ft., T.D. 9,960 ft.

LOUISIANA GULF COAST DRILLING REPORT

Calcasieu Parish

Gulf 1 Calcasieu National Bank, Hayes prospect, 18-11s-5w, drilling shale 3,752 ft.

Iberia Parish

Gulf 1 Petit Anse Co., projected deep test, Avery Island salt dome, drilling sand 5,165 ft.

Iberville Parish

Titanic 1 Natalbany Lumber Co., St. Gabriel prospect, 7,9s-12e, drilling sandy shale 7,128 ft.

Jefferson Davis Parish

Union Sulphur 1 Latrielle, South China field, 11-8s-4w, drilling shale 9,510 ft.
Continental 1 Jaenke, South Roanoke field, 24-10s-4w, drilling 11,260 ft.

Plaquemines Parish

Phillips 1 State-Bastian Bay prospect, 48-20s-29e, drilling 2,300 ft.

Rapides Parish

Lynes & Douglas 1 B. F. Phillips, Glenmora prospect, 15-1s-2w, first report.

St. Bernard Parish

California and Tide Water 1 Biloxi Marsh Lands Co., 25-12s-16e, drilling shale, sidetracked hole 6,990 ft.

St. Mary Parish

Humble 1 Miami Corp., 15-15s-6e, drilling shale 3,542 ft.
Sun 1 Belle Isle Corp., Belle Isle dome, drilling sandy shale 7,258 ft.

Terrebonne Parish

Bering Oil 1 Nellie Land, Schriever prospect, 9-16s-16e, 10¾-in. casing 2,060 ft.

Illinois Oil Men Adopt Measure Opposing Federal Intervention

Directors of the Independent Oil Producers of Illinois met in Centralia, Ill., last week, and adopted a resolution opposing federal control of the oil industry as outlined in the pending Cole bill. Copies of the resolution were forwarded to Illinois senators and congressmen, Speaker Sam Rayburn and members of the Cole committee. In defining its opposition the association averred in the resolution that the oil industry, through private initiative and enterprise, had become one of the greatest industries in the nation and that its employes were among the country's best paid workers.

West Outpost in East Flour Bluff May Have New Sand

By
F. L. SINGLETON

CORPUS CHRISTI, Tex., Jan. 27.—Possible production from a new and deeper sand in the East Flour Bluff field, Nueces County, was attracting considerable attention among Southwest Texas operators as Humble 6-D State, located on the west edge of the structure, continues to drill below 8,040 ft. after logging favorable showings of oil and gas. Sand with a gas odor was cored at 7,794-7,608 ft., sand with an oil odor at 7,928-41 ft. and saturated sand was cored at intervals from 8,006-18 ft. This is the second well to be drilled below the discovery 7,600-6,800-ft. pay. The first test, 3-E State, located about 4,000 ft. due south was dry at a total depth of 8,394 ft. due to an attempt to blow out. East Flour Bluff is said to be located east of a major fault which separates production from that of the Flour Bluff field.

In the St. Charles field, Aransas County, Continental 3 St. Charles, about 1,800 ft. east of the discovery well, is bottomed at 11,472 ft., and 5½-in. casing is being cemented preparatory to testing. This is the deepest test drilled in the field, and the second deepest test ever drilled in the district. Distillate production was established in Continental 2 St. Charles at 7,600 ft. and, while details of the core record of the deep test were not available, it is assumed that several possible sand sections below the discovery horizon have been logged inasmuch as 7⅝-in. casing was previously cemented at 9,035 ft.

McSpadden Co. et al 1 E. Clark, the discovery well of a new field, 9 miles south of Port Lavaca, Calhoun County, is reported to have flowed 107 bbl. of 54-gravity distillate per day through a ⅛-in. choke and a ⅞-in. bottom-hole choke. Tubing pressure was 650 lb., and shut-in casing pressure 1,300 lb. Production is from the Frio section through perforated casing at 5,891-92 ft.

Location for a Pettus sand test, 7 miles north of San Diego, Duval County, was staked by Wilcox Oil & Gas Co. on the P. G. Garcia lease in the San Diego De Arriba grant. Interest in wildcat activity in this county is centered on Henshaw Brothers et al 1 Gonzales, 10 miles north of Premont in the El Senor de La Carrera grant. The well topped the Jackson at 5,846 ft., Hockleyensis at 6,146 ft., and while drilling at 6,308 ft., the well attempted to blow out. The well was brought under control, but the drill stem was found to be stuck 14 ft. off bottom.

SUMMARY OF COMPLETIONS

Lower Gulf Coast			
Oil wells: Fields	6	822	32,786
Dry holes: Fields	3		20,042
Total	9		52,828
Laredo District			
Oil wells: Fields	3	246	3,629
Dry holes: Fields	7		22,861
Wildcats	7		13,088
Total	17		39,577
San Antonio District			
Oil wells: Fields	1	2	1,384

Thomaston Field Test Runs High

In the Thomaston field, De Witt County, Atlantic 1 Zengerle, about 4,000 ft. northeast of the discovery well, is drilling in sand below 8,600 ft. The Wilcox was topped by an electrical survey at 7,730 ft., which places the well structurally higher than the discovery well.

The southeast limits of the Alice field, Jim Wells County, was further defined with the completion of a dry-gas well by H. H. Howell on the Cummings lease, Section 60, L. G. Collins subdivision. The well was completed through perforated casing at 5,135-58 ft. and was shut in after flowing gas through a ½-in. choke. Tubing pressure was 1,750 lb., and casing pressure 1,820 lb.

With two wells in the process of completion, additional locations were made in the La Gloria field, Jim Wells County, by La Gloria Operators Committee. The new locations are C. L. Scott, about 4,000 ft. east of Magnolia 1 Maun, 1 N. Lafferty about 1 mile northeast of production and 1 Birdie Riley about 3,500 ft. southeast of the committee's 1 Arguellez, across the county line in Brooks County. The latter well showed gas and distillate at 6,037-60 ft., 6,545-60 ft., and 7-in. casing was cemented on bottom at 6,650 ft.

In Live Oak County, 5 miles southwest of George West, Edwin M. Jones is moving in a string of 9⅝-in. casing which will be cemented as a production string in 3-B George West, a projected 8,500-ft. Wilcox test. A drill-stem test in the Pettus sand at 3,622-27 ft. recovered 25 ft. of oily mud and 5 lb. working pressure.

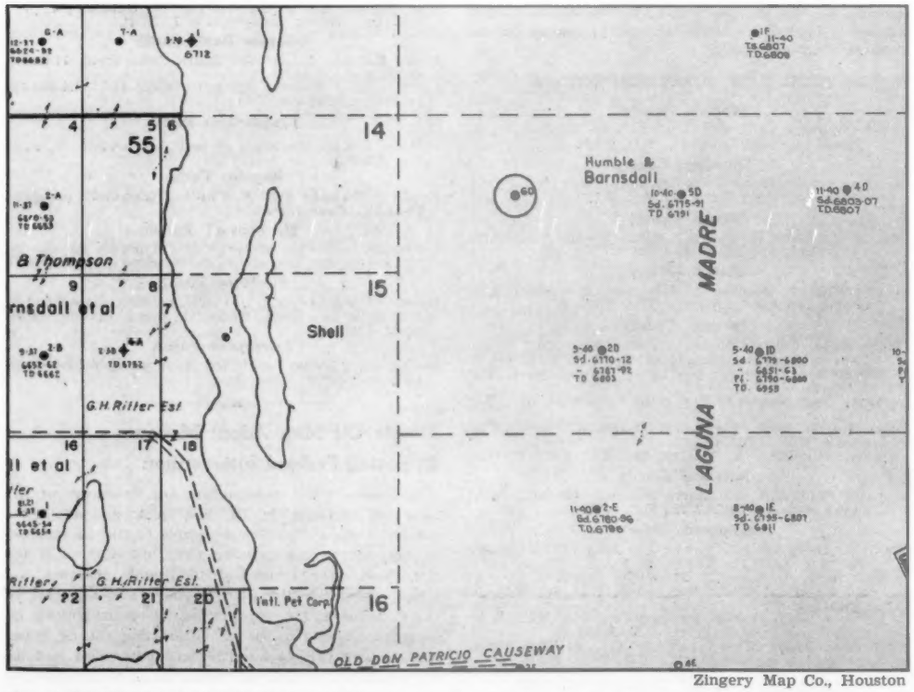
Carrizo Springs Discovery Watched

In San Patricio County, and located about 2 miles southeast of Gregory, D. P. Neill is reported to have cemented 5½-in. casing in 1 W. W. Toland, and preparations are being made to test sand at intervals from 5,900-6,100 ft. This well, originally drilled by Abbott & Traxler, is located in the Geronimo Valdez Survey.

In the newly opened Carrizo Springs area, Dimmit County, H. H. Weinert is moving in material for 1 S. E. McKnight, located about 2,600 ft. southeast of the discovery well. The discovery well, Producers Corp. 1 S. E. McKnight, flowed 225 bbl. of oil in 98 hours through open 2-in. tubing ending at 7 a.m. January 19. The well is now reported to be flowing at the rate of 3 bbl. of oil per hour with pressure ranging from 100 to 200 lb. While completed as a small well, the discovery has attracted wide attention and leasing along this trend is said to be brisk.

V. F. Neuhaus 1 Gallagher, a wildcat located southeast of Randado, is drilling in sand below 2,922 ft. and after a 15-minute drill-stem test at 2,918-22 ft. recovered salt water and tested 5-lb. working pressure.

In Starr County and located in the A.B.&M. Survey No. 39, Sun 4 East is bottomed at 4,260 ft. and sidewall cores are being made of a sand section at 2,500-30 ft. Sand with a good odor was cored at 4,019-49 ft.



Zingery Map Co., Houston

Plat of the East Flour Bluff field, Nueces County, showing location of Humble 6-D State (indicated by circle) which has shown promise of opening production from a new sand

SOUTHWEST TEXAS COMPLETIONS

Aransas County

McCampbell field: Mar Production 1 Parks, 72 bbl., jetting, perf. casing 7,102-05 ft., T.D. 7,201 ft.
Wildcat: Gulfboard 1-239 State, dry, T.D. 9,257 ft.

Jim Wells County

Wade City field: Rodney DeLange 14 McNeil, 214 bbl., ⅞-in. choke, perf. casing 4,918-26 ft., T.D. 4,942 ft.
Rodney DeLange 22 McNeil, 206 bbl., ⅞-in. choke, T.D. 4,932 ft.

Nueces County

Clara Driscoll field: Magnolia 5 Driscoll, 38 bbl. in 12 hr., ⅛-in. choke, perf. casing 3,804-06 ft., T.D. 3,820 ft.
Stratton field: Conroe Drilling Co. 3-B Sellers, 210 bbl., ⅞-in. choke, perf. casing 6,401-16 ft., T.D. 6,525 ft.
Wildcat: H. J. Mosser 1 Eggleston, dry, T.D. 5,934 ft.

San Patricio County

Midway field: William Morgan 1 Schmidt, 82 bbl. oil plus 40 per cent salt water, ¼-in. choke, T.D. 5,366 ft.
Wildcat: Arkansas 1 Kellerman, dry, T.D. 4,851 ft.

LAREDO DISTRICT

Duval County

Casa Blanca field: Texas 40 Duval Co. Ranch Co., 104 bbl., T.D. 1,048 ft.
Charamousca field: Magnolia 3 Duval Co. Ranch Co., 120 bbl., ¼-in. choke, sand 1,533-37 ft.
Lundell field: Magnolia 1 Duval State, dry, T.D. 1,718 ft.
Peters field: Smith & Storey 1 Sutherland, dry, T.D. 2,676 ft.
Wildcat: G. W. Basom 1 Nueces Land & Livestock Co., dry, T.D. 1,227 ft.
Mudge 1 Gruy, dry, T.D. 2,920 ft.

Hidalgo County

Nichols field: Royalty Oil & Gas 1 Yturria Town & Improvement Co., dry, T.D. 3,138 ft.

Karnes County

Wildcat: Luling Oil & Gas 1 Newberry, dry, T.D. 3,003 ft.

Jim Hogg County

Kelsey field: Humble 1 Pena, dry, T.D. 5,233 ft.

Magnolia 1 State Marshall, gas well, perf. casing 4,707-10 ft., T.D. 4,775 ft.

Live Oak County

Ezzell field: B. F. Cowan 8 Swearingen & Miller, 9 bbl., pumping, perf. casing 1,502-11 ft., T.D. 1,552 ft.
Wildcat: Danciger 1 Lewis, dry, T.D. 1,752 ft.
Humphries & Hotchkin 1 Riley Webb, dry, T.D. 2,121 ft.

McMullen County

Wildcat: Harry Ezzell 44 fee, gas well, perf. casing 1,218-28 ft., T.D. 1,542 ft.
Van Dresar 4 Brown, dry, T.D. 772 ft.

Starr County

Sun field: Sun 8-A Montalvo, dry, T.D. 5,156 ft.

Webb County

Leal field: W. C. McBride 3 Leal, dry, T.D. 3,471 ft.
Wildcat: Pocono Development 1 Adami, dry, T.D. 1,313 ft.

Zapata County

Charco Redondo field: McCullom V-C T. Gutierrez, dry, T.D. 1,469 ft.
Escobas field: Dulup 3-C Garcia, 22 bbl., pumping, sand 1,027-43 ft.

SAN ANTONIO DISTRICT

Bexar County

Somerset field: H. A. Potter 1 Miller, 2 bbl., pumping, T.D. 1,384 ft.

SOUTHWEST TEXAS DRILLING REPORT

Aransas County

Humble 1-27 State, St. Charles Bay, coring sand 9,210 ft.

Atascosa County

Henderson Coquat 1 Beshears, J. S. Loving Sur., top Yegua 960-90 ft., Cook Mountain 990-1,027 ft., Sparta 1,503-39 ft., Weches 1,539-59 ft., Queen City 1,630-1,725 ft., drilling shale 2,024 ft.

(Continued on Page 219)

Canadian Fields

(Continued from Page 204)

Northwest-West Petroleums 1, LSD 3, 20-5-23w4, coring the upper Madison to 6,141 ft., has shown some saturated sections. Initial drill-stem test was inconclusive and a further test is being made.

May Reopen Skiff Field

Results of acidization in the Steveville field in the Alberta plains area may lead to reopening of the Skiff field, discovered nearly 20 years ago by O. G. Devenish and associates of Calgary. Devenish No. 1 flowed 3 to 5 bbl. of 20-gravity crude and for a time made 35 bbl. a day on the pump. There was a 34-ft. sand. Other wells got noncommercial showings, and operations were abandoned.

Vermilion Field

In the Vermilion field, East Central Alberta, Franco-Hamers 2, LSD 16, 19-50-6w4, cored the oil sand at 1,840 ft., crude rising a considerable distance in the casing. It has been capped, pending installation of a pump.

Saskatchewan Test

In the Little Pine area, western Saskatchewan, Little Pine Petroleums 1, NW 29-46-20w3, near Paynton, is rigging outfit from the abandoned North Taber Royalties well in southern Alberta. Atlas Investments has the contract, with Glen Boller supervising, and test will likely spud in February. Gas is expected from two sands around 1,400 and 1,700 ft., with oil horizons at 1,800 and 2,300 ft., the latter being the Devonian lime contact. The potential field, 45 miles east of Lloydminster and 25 miles west of North Battleford, covers four townships and is a pronounced dome structure with closure on all sides.

British Columbia Test

In the Peace River block of northern British Columbia, Provincial Government 1, Commotion Creek, has a fishing job between 5,100 and 5,200 ft. Producing horizon is expected around 6,700 ft.

Ontario Drilling

Chatham Township: Union Gas 30, Lot 17, Concession 10, is testing somewhat east of the gas area, and drilling below 1,525 ft.

Orford Township: Union Gas, Lot 54, North Talbot Road, around 1,900 ft., waiting repair parts, looks like dry hole.

Oneida Township: Union Gas 254, Lot 11, West Plank Road, drilling.

North Cayuga Township: P. L. Jackson, Lot 17, Concession 1, North Talbot Road, 10,000 cu. ft. of gas a day at 750 ft.

Woodhouse Township: Achilles Gas Syndicate, Lot 24, Concession 3, location.

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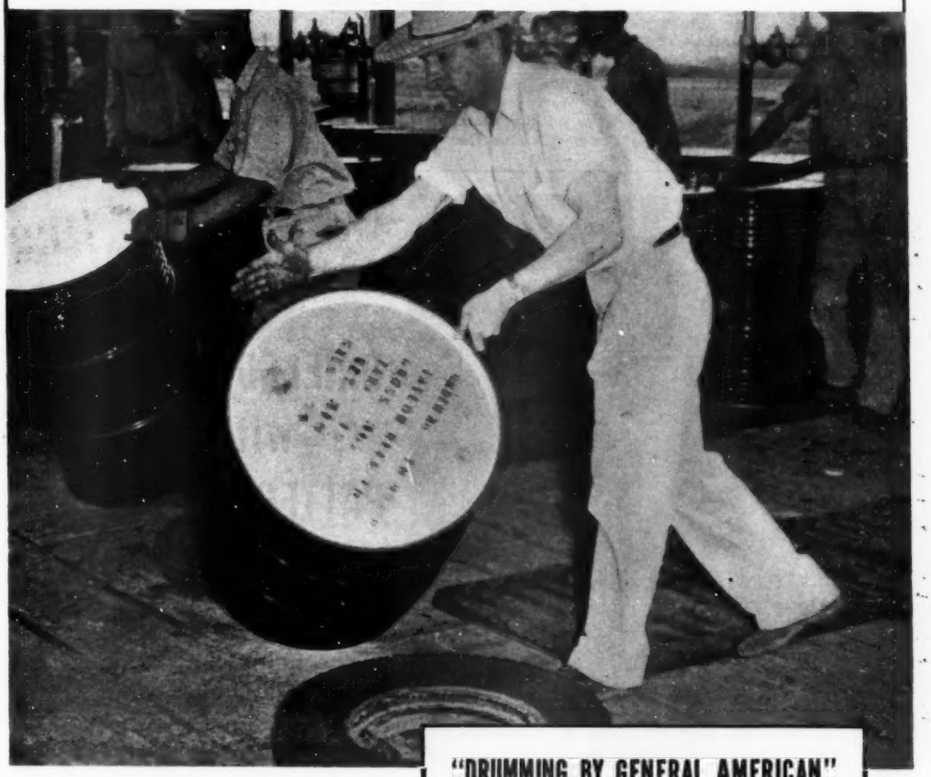

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A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

APPALACHIAN FIELDS

Ripley District Deep Test Opens Low-Volume Gas Pay

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Jan. 22.—During the past week 15 operations were reported from the lower eastern fields, of which 4 were dry and 11 were gas wells.

In Ripley district, Jackson County, West Virginia, the wildcat of the United Carbon Co. on the B. B. Meadows farm was bottomed at 5,280 ft., with the Corniferous lime at 5,081-5,180 ft. and Oriskany 5,180 ft. to bottom. It was plugged back to 5,218 ft. and shot at 5,183-5,218 ft. It had a volume of 455,000 cu. ft. of gas a day 2 hours after shot and rocked up to 1,620 lb. in 24 hours.

This test is about 2 miles northwest of Kenna and about 6 miles northwest of the extension of the Elk-Poca Oriskany gas fields in Jackson County. There are no gas lines close enough for a test on this well and production is not sufficient to warrant a line. However, the well will be saved and the gas probably used in future wildcats which are assured by the test.

A deep test expected to go to the Trenton is being drilled by Ohio Oil Co. in northwestern Pennsylvania approximately 6,000 ft. south of Lake Erie, 660 ft. east of the Pennsylvania-Ohio state line and 1½ miles east of Conneaut, Ohio. It is 1 Jay Childs, Lot A, Springfield Township, Erie County, Pennsylvania. The well had the top of the Onondaga at 1,390 ft. and is now drilling below 1,800 ft.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. resumed drilling after casing in the Onondaga in 3 Piedmont Coal Co. and reached 6,790 ft. without striking the cherty zone. Their No. 4 is drilling at 1,041 ft. New Penn Development Co., William E. Snee et al have reached 5,387 ft. in 3 Summit Hotel. In North Union Township Wasson & Co. et al made no progress during the week in 2 J. H. Sorg.

In Beaver County L. D. McMichael et al have reached 2,200 ft. in the wildcat on the Elmer Pflug farm in New Sewickley Township with the surface elevation now set at 1,153 ft. This should place the Onondaga about 5,200 ft.

SUMMARY OF COMPLETIONS

Southwest Pennsylvania

	No.	Bbl.	Footage
Gas wells	6	*4.3	17,103

West Virginia

Gas wells: Oriskany	2	*3.6	8,008
Other fields	3	*0.2	6,810
Total	11		31,921

*Million cu. ft.

Armstrong County

Kittanning Township: Local Co. 1 B. H. Schreckengast, 94,000 cu. ft. gas, Fifth, Speechley, and Tiona sands, T.D., 3,478 ft.

Wayne Township: Louden Drilling Co. 1 Armstrong County Trust Co., 80,000 cu. ft. gas, Bradford sand, T.D. 3,579 ft.

Fayette County

Franklin Township: George L. Yaste et al 1 Allen Flemming, 470,000 cu. ft. gas, Injun sand, R.P. 650 lb., T.D. 1,393 ft.

Nicholson Township: Wahler Powers 1 Geneva Supply Co., drilled deeper, 3,000,000 cu. ft. gas, Injun sand, gas 1,335-52 ft., T.D. 1,352 ft.

Greene County

Whiteley Township: Johnson & Eddy 1 Hoge, 668,000 cu. ft. gas, Bayard sand 3,331 ft., gas 3,343-3,548 ft., R.P. 800 lb., T.D. 3,360 ft.

DRILLING

Westmoreland County

Derry Township: Latrobe Steel Spring Co. 1 Keystone Coal, 10,000 cu. ft. gas through first and second Bradford, T.D. 3,941 ft.

Armstrong County

Boggs Township: J. K. Sharp et al 1 James Sefton, 3,464 ft.
John Wray et al 3 Ralph Williamson, 941 ft.

Burrell Township: Equitable 1 James & Mary Fiscus, rigged up.

Cowanshannock Township: Equitable 1 J. C. Wilson, 2,277 ft.
Shelocta 1 Park Rearick, 2,200 ft.
William McCollins et al A. L. McCullough, 280 ft., S.D.

Kittanning Township: L. L. Livengood 1 Harry Wright, moving in.

Plum Creek Township: Peoples 2 Mrs. John Boyer, 2,525 ft.
Peoples 3 Mrs. John Boyer, 3,561 ft.
Peoples 1 W. J. Boyer, building rig.
James Wright 1 fee, 270 ft.
Shelockta 2 Harry Kough, 3,140 ft.

South Buffalo Township: Pleasant Valley Oil & Gas 1 C. J. Stepp, 1,385 ft.

Wayne Township: Galbraith et al 1 William Alcorn, 2,830 ft.

Clarion County

Red Bank Township: T. W. Phillips 1 M. Wolfgang, 1,844 ft.

Fayette County

Menallen Township: Wahler Powers 2 W. L. Rockwell, 300 ft.

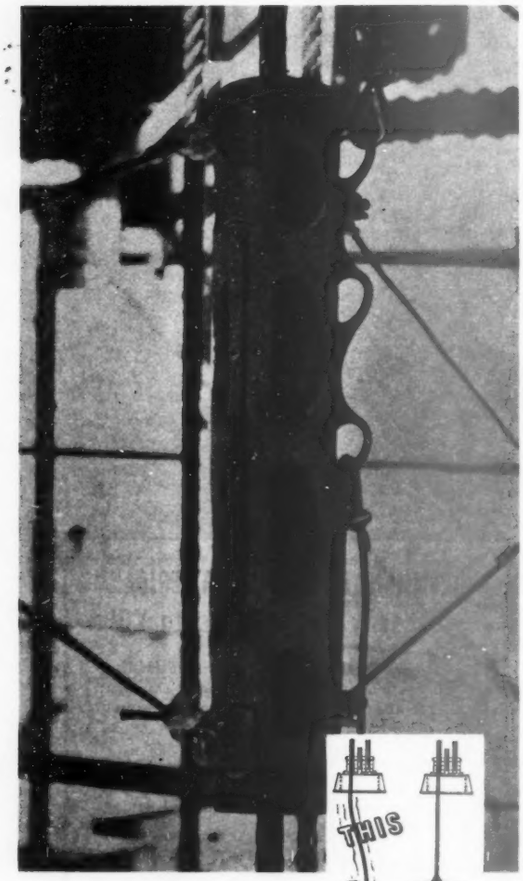
Nicholson Township: Duquesne 1 Louise Collins, 2,016 ft.

Greene County

Jackson Township: Equitable Gas 1 William Karr, 1,560 ft.
Cleveland Cameron Oil & Gas 1 Cleveland Morris, 1,080 ft.
H. E. Milliken et al 1 E. Chaney, 1,300 ft.

Monongahela Township: H. B. Scott et al 1 Andrew Kovak, 1,010 ft.

(Continued on Page 228)



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Patterson-Ballagh WIRE LINE GUIDES

Two New Pools in Okfuskee Forecast Continued Activity

By ROBERT INGRAM

EAST Central Oklahoma, one of the state's oldest oil areas, held the spotlight again this week with important tests, completions and leasing. With two discoveries already marked up in Okfuskee County and a gusher in Pottawatomie County, attention was turning to new drilling in these areas.

Selden Henry and Keener Oil & Gas had made no announcement about their plans for more wells to follow up their discovery at 1 Dudgeon, NE SW SE 36-12-9, but it was reported they had three more locations to drill in the near future. Oil circles voiced a difference of opinion as to whether the discovery was in the Gilcrease, as reported by the operators, or in the Dutcher, and future development seemed to hinge on confirmation of one formation or the other as the pay zone.

It was pointed out that an old abandoned producer lies about ⅛ mile north which yielded sporadically from the Gilcrease before it was plugged and capped. The Henry well, however, is producing steadily and after several weeks of testing was marked up as an official completion with an initial yield of 205 bbl. daily, pinched.

Meantime the Deep Rock Oil and Fred Coogan 1 Earl Davis, SW SE NE 20-11-9, southwest of Okemah, which was reported last week as a gas discovery, yielded 80 bbl. of distillate along with approximately 53,000,000 cu. ft. of gas after treatment. The Oklahoma Natural Gas Co. is taking 3,500,000 cu. ft. of gas daily.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Jan. 25	Jan. 18
Allen	4,775	4,825
Billings	6,225	6,200
Burbank	7,300	7,200
South Burbank	7,250	7,325
Balance Osage	16,850	16,600
Blackwell district	3,325	3,325
Bristow-Slick	6,325	6,275
Chandler	1,025	1,025
Crescent	2,125	2,000
East Cromwell	2,050	1,900
Cromwell	2,875	2,825
Cushing-Shamrock	8,825	8,800
Duncan	3,550	3,550
Edmond	3,700	3,575
Fish	2,850	2,850
Fitts	13,750	13,600
Jesse	1,900	1,850
Graham-Fox	2,225	2,225
Gray	875	850
Healdton	8,350	8,300
Hewitt	8,125	7,650
Keokuk	2,800	2,750
Konawa	975	975
Lucien	6,350	6,400
Moore	1,050	1,050
Northeastern counties	17,050	16,750
Oklahoma City	90,700	85,975
Olympic	1,725	1,725
Ramsey	3,475	3,450
Sasakwa	1,375	1,375
Sholem-Alechem	2,450	2,550
Seminole district:		
Bowlegs	6,350	6,425
Carr City	2,150	2,125
Dora	1,525	1,550
Earlsboro	3,950	3,875
East Earlsboro	1,725	1,725
South Earlsboro	525	550
Little River	6,525	6,325
East Little River	650	625
Mission	1,250	1,250
Seminole	6,375	6,250
East Seminole	1,050	1,025
Searight	1,800	1,800
Total Seminole	33,875	33,425
St. Louis-Pearson	20,450	21,375
Tatums-Tussy	4,775	4,750
Tonkawa-Garber-Thomas	3,550	3,600
Wewoka	1,575	1,575
Yale-Jennings	3,050	3,050
Total Oklahoma	392,000	388,550

Gusher Passes Estimates

The state's first gusher for the year, Culver and Shepherd 3 Waite, NW SW NE 9-5-5, in the West Konawa area of Pottawatomie County, also reported last week, passed all early estimates of production and was being estimated at from 2,000 to 2,500 bbl. On initial test last week it showed for 2,000 bbl. a day after getting the Hunton lime at 2,370-2,602 ft., and later did an estimated 2,500 bbl. into tanks with about 1,500 bbl. into pits in 15 hours. It is shut in for pipeline connections.

Good wells were also completed in the St. Louis district, the West Seminole area and the Dill pool. Phillips Petroleum Co. continued testing at 1 Joney, SE NE NE 34-12-8, which flowed 386 bbl. in 8 hours. Operators were to run tubing. Total depth is 3,674 ft. in the Cromwell.

Along with the gain in drilling came petitions for special spacing regulations in several areas. Besides the Arrow Drilling Co. petition for 10-acre spacing near the Henry 1 Dudgeon, M. W. Lee and H. E. Lee, both of Boley, asked the Corporation Commission for permission to disregard the 10-acre spacing rule in the Dill pool where they own NE NW 35-12-8. Because a faulted condition has been found to exist in the area, the Lees seek the right to drill 100 ft. from the line, which would upset present regulations. A hearing was held January 24.

Lease trading continued fairly active in Okfuskee County with major companies gradually increasing their holdings. Ohio Oil Co. was one of those to buy into the area along with Magnolia Petroleum Co., Phillips Petroleum Co., and Winona Oil Co.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Cumberland	1	248	5,099
Dill	2	1,000	7,273
Oklahoma City	2	914	13,058
St. Louis	2	500	7,882
Other fields	4	639	7,525
Wildcats	2	285	7,489
Dry holes: Fields	2		6,408
Wildcats	6		17,190
Total	21		71,924

Chickasha Gets Record Gasser

The Chickasha gas field of Grady County had a record producer in Oklahoma Natural Gas 1-B Sandford, W½ NW SW 23-5-8w, which froze connections and meters during one test. Company engineers installed heaters for further tests while estimates of the volume ran to 300,000,000 cu. ft. a day or even more. Production is from the Charlson sand through casing perforations at 4,106-4,292 ft. The company plans another test soon on the same tract. Magnolia, Skelly Oil Co., and Sinclair Prairie are also drilling at Chickasha.

Wildcatters got off to a good start in Kay County with four operations under way. They are Continental 1 Cronan, NW NE SW 23-28-3; Marland 1 Kreger, SE SE NE 4-25-2w, 5 miles west of Tonkawa, on a 3,000-acre block; Earl Williams 1 Trueblood, SE SE 25-25-1w, and L. A. Cullison et al 1 Casemore, SE SE NW 15-26-1e, west of Ponca City.

OKLAHOMA COMPLETIONS

Bryan-Marshall Counties

Cumberland pool: Pure 1 Crisman, NE NE 29-5s-7e, flowed 248 bbl. through ½-in. choke, Bromide 4,675 ft., sand zone 4,953-5,043 ft., casing 4,833 ft., T.D. 5,099 ft., P.B. 5,082 ft.

Carter County

Healdton field: Magnolia 85 Richards, SE SW SE 31-3s-3w, pumped 40½ bbl., sand 1,227-29 ft., casing 1,221 ft., T.D. 1,229 ft.

Creek County

Wildcat: Trigg et al 1 Jennings, NW SW NE 18-16-8, dry, sand 3,697-3,710 ft., Wilcox 3,678-94 ft.

Jackson County

Altus pool: Altus 4 Maude, SE NW NE 15-1-20w, pumped 72 bbl., casing 1,390 ft., T.D. 1,595 ft.

Jefferson County

Wildcat: Danciger 1 Hefner, SE SE 3-4s-4w, dry, T.D. 4,256 ft., Arbuckle 3,609 ft.

Kay County

Braman area: Tide Water 2 State, E½ W½ SW 16-28-1w, flowed 512 bbl. oil, 15 bbl., salt water from Wilcox 3,510-3,640 ft., T.D. 3,665 ft.

Muskogee County

Wildcat: Storm Feltz 1 Moore, NW SE SE 4-14-17, dry, Wilcox 2,458 ft., T.D. 2,478 ft.

Okfuskee County

Dill pool: Droppleman 7 Dill C, SW NE SE 34-12-8, flowed and swabbed 400 bbl., Wapanucka 3,549 ft., Cromwell 3,556-88 ft., casing 3,550 ft., T.D. 3,599 ft.

Seran 1 Roberts, NE SE NE 34-12-8, flowed 600 bbl., Cromwell 3,639 ft., casing 3,639 ft., T.D. 3,674 ft.

Wildcat: Henry 1 Dudgeon, NE SW SE 36-12-9, 205 bbl. pinched, Gilcrease 3,055 ft., Cromwell 3,284 ft., casing 3,276 ft., T.D. 3,297 ft., P.B. 3,113 ft., shot 3,084-3,110 ft.

Deep Rock 1 Davis, SW SE NE 20-11-9, flowed 80 bbl. distillate, selling 3,500,000 cu. ft. gas to Oklahoma Natural Gas Co., T.D. 4,192 ft., P.B. 3,986 ft., perf. 3,916-60 ft., gaged 6,000,000 cu. ft. gas, acid, gaged 58,284,000 cu. ft. gas, R.P. 1,500 lb.

Oklahoma County

Oklahoma City pool: Jones 4 Harn, NW SE NW 27-12-3w, pumped 540 bbl., Simpson dense 6,413 ft., sandy dolomite 6,455 ft., casing 6,433 ft., Wilcox 6,457 ft., shot 6,480-6,521 ft., T.D. 6,554 ft., shot 6,527-50.

Ptak 1 Lyons, NW NE SW 34-12-3w, pumped 374 bbl., casing 6,432 ft., Wilcox 6,470 ft., shot 6,484-6,531 ft.

Pawnee County

Mannford district: Reynolds 4-A Ackley, SW SE SE 14-20-9, pumped 15 bbl., casing 1,194 ft., Layton 1,206-41 ft., T.D. 1,241 ft., P.B. 1,237 ft., shot 1,208-37 ft.

Wood 1 Comar, SE NE NW 22-20-9, dry, Oswego 1,694-1,745 ft., sand 2,155-68 ft., T.D. 2,168 ft.

Watchorn pool: Watchorn 1 Childs, C NE SW 9-22-3, dry, T.D. 4,240 ft., Wilcox 4,225-40 ft., casing 3,928 ft., P.B. 4,165 ft., 2,000 ft. of fluid in the hole.

Wildcat: Atkinson 1 Wilderson, NW NE NW 14-22-4, old well P.B. from 3,620 ft. to test Oswego 3,080-3,240 ft., dry.

Payne County

Wildcat: Home Gas 3 Parker, NW NE 26-18-5, old T.D. 3,670 ft., deepened to Wilcox 3,769-3,855 ft., dry.

Pontotoc County

Wildcat: Russell 1 Parks, NW SW NE 35-5-8, dry, T.D. 2,650 ft., casing 2,650 ft., perf. 2,575-80 ft., 2,488-92 ft., 2,420-25 ft., 2,393-97 ft.

Pottawatomie County

St. Louis district: Smith 1 Vance, SW NW SW 5-7-4, flowed 250 bbl. pinched, Hunton 3,958-94 ft., casing 3,910 ft., T.D. 3,941 ft.

Smith 2 Lightfoot, NE NE 6-7-4, flowed 250 bbl., Hunton 3,908 ft., casing 3,910 ft., T.D. 3,941 ft.

Tillman County

Wildcat: Bale 1 Roark, NW SE 30-1-17w, casing 27 ft., T.D., location abandoned.

OKLAHOMA DRILLING REPORT

Caddo County

Thornton-Westcock 1 Cooke.....NE SE NE 35-5-9w
S.D. 407 ft.

Magnolia 1 McKoy.....SW SW SE 16-5-11
Cored 6,400-14 ft., brown lime, bubbling gas throughout, D.S. test no shows, chert 6,552 ft., drilling 6,595 ft. in Woodford.

Comanche County

Hamblen-Good 1 Phillips.....NE NE NW 34-1n-13w
Drilling 150 ft.

Creek County

R. R. Kirchmer 1 Carson.....NE SE NW 23-17-9
6-in. 2,541 ft., Mississippi lime 2,806 ft., drilling 2,816 ft.

Grady County

McCasland 2 Ball (twin).....NW SE SE 21-3-5w
T.D. 1,759 ft., rigging up standard tools.

McCasland 1-A Miles Kerns.....
1,220 ft. S and 1,220 ft. E, C 21-3-5w
Spud 20 ft.

Jackson County

G. R. Burke 1 Estes.....SW SW NE 34-3n-19w
Granite 1,065 ft., drilling 1,070 ft.

Jefferson County

Johnson 1 Bound.....
1,170 ft. N and 150 ft. E, SW cor. 13-6s-6w
T.D. 1,855 ft., tested est. 10 bbl. oil and 150 bbl. water, to recement.

Hampton-Stelley 1 Pealor.....NW NE NW 33-7s-6w
T.D. 302 ft., 10-in. 155 ft.

Kay County

Earl Williams 1-A Trueblood SW NE SE SE 25-25-1w
T.D. 2,424 ft., 200 ft. oil in hole and H.F.W., drilling with tools.

Marland 1 Kreger.....SE SE NE 4-25-2w
Fort Riley 810 ft., Foraker 1,355 ft., Pawnee 1,695 ft., Bird Creek 1,855 ft., Deer Creek 2,070 ft., Hoover 2,198 ft., drilling 3,365 ft.

Union 1 Long.....NW NW NW 29-28-1
Drilling by fish at 3,357 ft.

(Continued on Page 219)

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Among the Drilling

HOUSTON Drilling Co., Houston, Tex., is drilling below 5,000 ft. in R. A. Irwin 1 South Texas Development Co., a wildcat located in the southeast part of Grimes County, Texas.

BUTLER & HORNE Drilling Co., Dallas, Tex., contractors on Humble Oil & Refining Co.'s newest Swastika sand discovery well in Jones County, West Central Texas, are skidding rig for an offset for the company. The discovery was 2 J. C. Sears, completed for 1,182 bbl. daily from saturation at 3,010-22 ft. Location was in Section 37, Block 18, T.&P. Survey. The offset will be 1-B D. O. Huddleston, 467 ft. from the south and east lines of Section 38, same block and survey.

O. W. DYER, Houston, Tex., is preparing to set a long string of casing in Continental 3 St. Charles, located in the St. Charles field, Aransas County, Texas. The hole is bottomed at 11,472 ft., which makes this test one of the deepest ever drilled in this district. In the Thomaston field, De Witt County, Texas, drilling continues below 8,600 ft. in Atlantic 1 Zengerle, an outpost test located northeast of the discovery well.

RHODES Drilling Co., Abilene, Tex., is building derrick for a scheduled 3,850-ft. wildcat test in Taylor County, West Central Texas, for J. Bay Robertson of San Angelo, Tex., and James B. Dunigan of Breckenridge, Tex. It will be 1 G. O. Creswell, located about 5 miles southeast of Lawn and an equal distance north of Coleman County Strawn production. It is 530 ft. from the east and 467 ft. from the south lines of the SE Section 391, George Hancock Survey.

JACK FRAZIER, Houston, Tex., is moving a rotary about 3 miles southeast of the Dyersdale field, Harris County, Texas Gulf Coast, for H. C. Cockburn 1 L. A. Weiss, a 4,500-ft. Frio sand test.

LOFFLAND Brothers, Houston, Tex., are moving in a string of 5½-in. casing to J. Newton Rayzor 1 Christian, a wildcat located in the Chenango area, Brazoria County, Texas, which is bottomed at a total depth of 9,510 ft.

RED IRON Drilling Co., Marshall, Tex., has erected derrick and is moving in materials for a new test in the Hawkins area of Wood County, eastern Texas. It is to be drilled for A. A. Folson, Gladewater, and will be his 1 Lee Bell, 2,000 ft. southwest of the junked Manziel 1 Bell, wild gasser which blew out early in the Hawkins play several weeks ago. The test is in the Edward Wideman Survey.

ALLEN & MORRIS, San Antonio, Tex., have started drilling operations on a new contract in the Wade City field, Jim Wells County, Southwest Texas, for R. H. McElvain. Drilling continues below 8,500 ft. in Pan American 1-B Willamar Community, located south of the discovery well of the Willamar field, Willacy County, Texas. Two other operations are reported at the East White Point and Luby fields, Nueces and San Patricio counties, Texas, for W. R. R. Oil Co. and Seaboard Co.

GEORGE ECHOLS, Houston, Tex., opened a new field in coastal Louisiana with completion of his company's (Titanic Oil Co.) 1 Marrero Land Co., located near the city of New Orleans in what is known as the Westwego area, Jefferson Parish. Another rotary is located on the St. Gabriel prospect, Iberville Parish. In the Texas Gulf Coast, drilling was halted in 1 Ed. C. Smith at 7,200 ft., a wildcat located in the Cypress area, Harris County, and the rig is expected to be moved to the Double Gum area, Liberty County, where location was recently made for a deep test on the E. W. Boyt lease.

CROSBY Drilling Co., Houston, Tex., is moving a rotary to Jackson County, Texas Gulf Coast, for 1 A. Gayle, a wildcat located northeast of the town of La Ward, which will be drilled jointly with R. N. Ranger. Contract depth is 6,500 ft. In Lavaca County, Texas, tubing is being moved in to test McMurray 1 Allen, a prospective pool opener located in the Hallettsville area. Southwest of the Alta Loma field, drilling continues below 10,000 ft. in Strake 1 Griffith. In coastal Louisiana contract was received for an 8,500-ft. Wilcox test to be drilled in the Glenmora area, Rapides Parish, for Lynes & Douglas.

SAWYER Drilling Co., Houston, Tex., is completing a well in the East White Point field, San Patricio County, Southwest Texas, for R. A. Welch, and is drilling below 9,200 ft. for Tide Water Associated Oil Co. in the Old Ocean field of Brazoria County.

HELMERICH & PAYNE, Tulsa, have been awarded drilling contract for a new Foard County, North Texas, wildcat test. It is to be drilled

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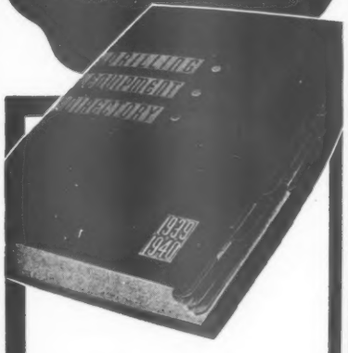

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for Texas Co. as 1 J. F. Harabel, 990 ft. from the north and 330 ft. from the west lines of Section 431, Block A, H.&T.C. Survey, on a block of 5,000 acres. The contract depth is set at 4,500 ft.

NICHOLS Drilling Co., Houston, Tex., has one rotary operating in the Horseshoe Bayou field of St. Mary Parish, coastal Louisiana, for Texas Co., two rigs at the Ville Platte field, and one at the Tepetate field for Continental Oil Co., while one operation is reported for themselves in the Ritchie field, Acadia Parish.

C. S. HERRING, Abilene, Tex., is the contractor on a recently staked wildcat test in Jones County, West Central Texas, and between the Akard field and the recently opened Stith field. It is 1 A. M. Wimberley, located 330 ft. from the south and west lines of Godwin Subdivision 87, De Witt County School Land Survey, being drilled for Harry Hines and W. D. Brookover. It is preparing to spud early in February.

T. A. CARLTON, Houston, Tex., is moving in a rotary to Waller County, Texas, for Kirby Petroleum Corp. 1 P. H. Donegan, a projected 8,000-ft. wildcat located on the east flank of the Brookshire dome.

HARRY L. EDWARDS Drilling Co., Houston, Tex., received contract from Shell Oil Co., Inc., for a 10,000-ft. test to be drilled in the active Old Ocean field, Brazoria County, Southwest Texas, where one rig has been running for several months for Harrison & Abercrombie. In the meantime a new contract was received from the General Crude Oil Co. for a well in the Esperson field, where one rotary is already running for W. P. Luse. Four other operations are reported at the Dickinson, West Ranch and Abbeville fields for Pan American Production Co., Midstates Oil Co. and Continental Oil Co.

ROY POWERS, drilling contractor of Mount Vernon, Ill., has been awarded contract for drilling a wildcat in Section 12-2n-9e of Richland County, Illinois. The test is being drilled for Russell P. Johnson of Olney, Ill.

BASIN Drilling Co. at last reports was drilling below surface casing for Sun Oil Co. and Kentucky Natural Gas Co. at their 1 Neel heirs in Union County, Kentucky. The wildcat is located about 3 miles southwest of Corydon. In Point Township of Posey County, Indiana, Basin and North Central Oil Co. at their 1 Oakland City College drilled through 16 ft. of Aux Vases sand saturation and the hole was reported filled with several hundred feet of oil. The Glen Dean was topped at 2,020 ft. Location of the 1 Oakland City College is in NE NE SW 16-8s-14w.

STANDARD Drilling Co., Mount Pleasant, Mich., has been awarded contract for drilling a test in Alpena County, Michigan. The wildcat will be the N. J. Schorn and G. R. Thalman, Trustees 1 Walter Dean, located in NW NE SW 16-30n-8e in Alpena Township.

LOFFLAND Brothers, Tulsa, have the contract to drill 5 Edmundson, C SW NW 23-5-8w, for the Oklahoma Natural Gas Co. in the Chickasha gas field of Grady County, Oklahoma, where an estimated 300,000,000-cu. ft. well is still being tested for a new record for the field.

NOBLE Drilling Co., Tulsa, has been awarded contract to drill 8 Sanford for Stanolind Oil & Gas Co., C SW SW 23-5-8w. in the Chickasha gas field of Grady County, Oklahoma.

E. C. JOHNSTON, Longview, Tex., who also is a producer, pipe liner and refiner in the Mississippi area, is reported dickering for a sale of his properties so he can concentrate on contract drilling.

EXCHANGE Drilling Co., Tulsa, is one of a large number of operators holding acreage adjacent to Deep Rock Oil Co. 1 Davis, a pool opener and gas producer southwest of Okemah, Okla., SW SE NE 20-11-9.

OLSON Drilling Co., Tulsa, will drill to the Wilcox sand for Dunn, Miller and Porter at 2 Gill, NE NW SE 12-12-11e, at Ghost Hill between the Gypsy Hill and North Baltimore pools of eastern Okfuskee County. The 1 Gill is making 5,500,000 cu. ft. of gas a day from a higher formation.

PARKER Drilling Co., Tulsa, has set surface casing on a wildcat being drilled for Gulf Refining Co. in Posey County, Indiana, about 2 miles southeast of New Harmony. The new test is Gulf 1 James Barrow, in SW NW SW 8-5s-13w.

ROY POWERS, drilling contractor of Mount Vernon, Ill., is rigging up a Devonian wildcat test to be drilled for C. L. McGuire in Busseron Township, Knox County, Indiana. The wildcat is located in SE NE SE 13-5n-10w, just west of Oaktown, and is the McGuire 1 L. M. Bland.

J. B. BARNES Drilling Co., Centralia, Ill., is drilling a wildcat in Fremont County, Iowa, for J. A. Johnson of Centralia. The test is the 1 R. E. Lucas, 2 miles northwest of Thurman, in SW NE SE 28-70n-43w. At last reports the test was temporarily shut down at 1,079 ft. in the base of the Kinderhook shale.

JACK READ, at Mellen & Gear 1 Wood in Tishomingo County, Mississippi, was shut down at 1,675 ft. at last reports. Located in SE SE SE 21-4s-11e, the test found the Devonian at 469 ft., the Trenton at 808 ft., Carters at 1,031 ft., and the Knox dolomite at 1,545 ft. A good gas show was reportedly encountered at 1,580-93 ft.

REX Drilling Co., contractors on Union Producing Co. and Texas Co. 1-A W. G. Childress in the Tinsley field of Mississippi, has set the production string prior to completion. Located in NE SW 24-10n-3w, the well cored Woodruff pay from 4,646 to 4,680 ft.

HAWKINS & HOWELL is moving in machinery to make a casing test at Clint Crosbey 1 J. F. Allen, a wildcat in Attala County, Mississippi. An electrical survey was reported to have shown possible production at 4,018-25 ft. The 1 Allen is located in C E½ SE 33-13n-5e. At the Sharkey County wildcat of British-American Oil Co., the contractor was still waiting on orders. The test, 1 Houston, in NE SW 23-11n-7w, is shut down in sidetracked hole at 1,310 ft. after being carried to 4,027 ft. in red beds where drill pipe was stuck but recovered.

EDWARD B. STROM, Grand Rapids, Mich., last week was issued drilling permits for three Michigan wells, two in Muskegon County and one in Ottawa County, all three being drilled for Edward B. Strom, trustee. In Muskegon County, Dalton Township, the 1 Kaule is being spudded in NW NW NE 16-11n-16w, and location has been staked for 1 Kops in SW NE SE 9-11n-16w. In the Tallmadge area of Ottawa County, pits have been dug for 1 Zawadski in SE SW NW 34-7n-13w.

GLOBE Drilling Co., Lima, Ohio, at last reports was acidizing Frank Gouin 2 Grant estate in the Bloomingdale field of Van Buren County, Michigan. The well, in NE SE NE 15-1s-14w, is bottomed at 1,270 ft. in the Traverse lime.

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Possible Discoveries Testing Archer, Jack and Young

By
R. MARNE SANFORD

WICHITA FALLS, Tex., Jan. 27. — Three possible field discoveries were testing promising oil shows as the week closed in the North Texas district, one each in Archer, Jack and Young counties. The Archer County wildcat is Walter Gant and Barney Feagin 1 Hunter, Section 7, Block 1, H.&T.C. Survey, about 2 miles southwest of the Vogtsberger field which produces from the Strawn sand. The wildcat, last reported cleaning out following a 15-qt. shot, is attempting to establish commercial production from the deep Ellenburger lime from 5,381-91 ft. The Ellenburger was topped at 5,370 ft. and the hole is bottomed at 5,391 ft. Prior to the shot the hole had filled at the rate of 1 bailer of fluid per hour, showing some gas. This wildcat is located about 3 miles southeast of a failure the past week in the Caddo lime. The latter was Omohundro 1 Browning, Section 7, German Emigration Lands Survey, originally started as a mile-northwest outpost to the Vogtsberger field. This test was dry at 5,147 ft. after topping the Caddo lime at 5,130 ft. and attempting completion from a section of saturation from 5,130-37 ft.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil wells: Voth field	3	702	3,903
K.M.A. field	3	824	12,135
Young field	3	137	2,691
Other fields	8	2,097	22,363
Wildcat	1	15	707
Dry holes: Wildcats	9	.....	27,808
Fields	4	.....	7,709
Total	31	.....	77,316

West Central Texas

Oil wells: Fields	4	488	7,301
Dry holes: Wildcats	2	.....	4,221
Total	6	.....	11,522

In Jack County the long-testing wildcat by Rathke Oil Co. on the H. L. Mosely lands, John Harrison Survey, is again preparing to try for commercial production. It has been shut down for several weeks at 5,347 ft., pending possibilities of deepening. The test will be perforated from 4,498 to 4.552 ft. in the Marble Falls zone which showed a large spray of gas and some oil several weeks ago when drilled. The Marble Falls was topped 4,493 ft. and the 5½-in. liner is set at 4,750 ft.

In Young County a wildcat is testing for completion from the Caddo lime from 3,972-99 ft. and from 4,022-50 ft. It is R. P. Dorian 1 Grigsby, Section 416, T.E.&L. Survey. Located a mile east of Newcastle and ¼ mile east of the old Whitehead-Maxwell test drilled in 1924 which showed some oil from the Caddo lime, it is given a fair chance of opening new production. The 7-in. casing is set at 3,972 ft. and an acid treatment is scheduled early the coming week. No flows have yet been registered at the well.

Eastern Clay County was given a new wildcat test when Shell Oil Co., Inc., announced location for 1-A E. D. Coleman, 467 ft. from the north and east lines of Block 24, Calhoun County School Lands Survey, about 8 miles southeast of Henrietta. It is on a relatively small 1,000-acre block the company acquired early in the Fort Worth basin play of a year ago. The wildcat is about 8 miles west of the Worsham field in Clay County in which Gulf Oil Corp. is preparing to start a deep exploratory hole. The contract depth of Shell's new test is 6,200 ft.

In Baylor County British American Oil Producing Co. has made location for another wildcat. It is 1 Claude Cowan, in the SE cor. Section 102, T.&N.O. Survey, about 3 miles northeast of the recent 2-mile-north extension to the Seymour field. Should production be found in this test it will prove for production a strip about 8 miles in length and about 1 to 2 miles in width, all a part of the Seymour field and producing from the Palo Pinto lime.

NORTH TEXAS COMPLETIONS

Archer County

Wildcat: W. B. Omohundro 1 K. Browning, Sec. 7, German Emigration Lands Sur., top Caddo 5,130 ft., show oil 5,130-37 ft., tested sulfur water, dry at 5,147 ft.
W. B. Omohundro 1 Coleman, Sec. 52, Coleman subd., top Caddo 5,279 ft., top Ellenburger 5,918 ft., show oil 5,287-91 ft., dry at 5,959 ft.
E. C. Harlin 1 Waggoner, Sec. 30, Clark & Plumb subd., dry at 1,209 ft.
White & Duncan 1 L. A. Snyder, Lot 21, Thomas Toby Sur., Abst. 643, dry at 758 ft.
Hull-Silk field: Magnolia 5 Rutty B, 40 bbl. in 1 hr., ¾-in. choke, natural, 3,779-89 ft.
Young & Woody field: Young & Woody and Grace & Wood 2 Robertson, dry at 1,440 ft.

Clay County

Clay field: Boswell & Gilchrist 3 Hamilton, 4 bbl. daily, pumping, 255-65 ft.
Sussex Oil 19 Glasgow, 9 bbl., pumping, daily, 1,049-69 ft.
Wildcat: Perkins & Cullum 1 C. T. Taylor A, Sec. 44, Bacon subd., dry at 1,076 ft.
Hapgood field: R. C. Lipscomb 1 Hapgood, 112 bbl. oil and 34 bbl. water, 8 hr., ⅛-in. choke, 6,077-86 ft., P.B. from 6,103 ft.

Cooke County

Walnut Bend feild: Sinclair Prairie 4 S. L. Ramsey, 111 bbl. in 6 hr., open tubing, 4,751-72 ft.
Voth field: Kingery Bros. Drilling Co. 3 Trubenback, 58 bbl. in 8 hr., pumping, 1,329-39 ft.
Harvey Drilling Co. 2 Sicking, 53 bbl. in 4 hr., pumping, 1,259-81 ft.
Harvey Drilling Co. 3 Sicking, 35 bbl. in 4 hr., pumping, 1,260-83 ft.
Wildcat: Bridwell Oil 4 Trew B, E. F. Crow Sur., Abst. 1710, dry at 1,603 ft.

Montague County

Wildcat: T. F. Hunter 1 Fatheree, S. L. Gilleland Sur., Abst. 1225, dry at 5,043 ft., salt water.
Benson & Benson 1 Joe Benton, A. A. Lewis Sur., Abst. 478, top Caddo 5,718 ft., top Ordovician 5,980 ft., show oil in conglomerate from 5,819-30 ft., tested dry, T.D. 6,213 ft.
Benton & Holmes field: Mudge Oil 2 F. M. Custers, 64 bbl. in 5 hr., ⅝-in. choke, 3,442-75 ft.

Throckmorton County

Wildcat: Jack Bell 1 Housley, 15 bbl. oil and 15 bbl. water, pumping, 705-07 ft., located in Sec. 28, Comanche Indian Reserve.
Throckmorton field: E. T. Westmoreland 6 Eaton, dry at 375 ft.

Wichita County

Wichita field: W. L. Huddleston 1 Hart, 35 bbl. daily, pumping, natural, 1,304-32 ft.
K.M.A. field: Hanlon-Buchanan 1 Burnett B, 12 bbl. in 3 hr., ¾-in. choke, 100-qt. shot, 4,122-42 ft.
Hanlon-Buchanan 2 Burnett B, 45 bbl. in 3 hr., ¾-in. choke, 150-qt. shot, 4,109-43 ft.
Shell 17 Griffin, 92 bbl. in 6 hr., ¾-in. choke, 65-qt. shot, 3,826-50 ft.

Wilbarger County

Wilbarger field: Paradise Oil 9 Waggoner B, 9 bbl. daily, natural, pumping, 1,549-58 ft.

Young County

Young field: J. T. Harrell 7 Rogers, 75 bbl., daily, pumping, natural, 900-08 ft.
George Keith 1 Rogers, 26 bbl. in 12 hr., pumping, 894-905 ft.
L. T. Burns 4 E. J. Larrimore, 10 bbl. daily, pumping, 871-78 ft.
Graham field: T. D. Humphrey 1-A Butler, show oil 4,840-50 ft., treated 5,000 gal. acid, made 2 bbl. daily, dry at 5,046 ft.
Wilson & Webb 2 C. C. Robinson, dry at 848 ft.
Wildcat: Stilley & Hampton 1 Rothell, Sec. 214, T.E.&L. Sur., dry at 800 ft.

NORTH TEXAS WILDCAT REPORT

Archer County

W. B. Hamilton 22 Cartwright, 660 ft. from W and S lines, James Webb Sur., Abst. 664, T.D. 5,211 ft., P.B. 5,164 ft., 60-qt. shot 5,149-64 ft., cleaning out
Shell 1-B Coleman, 330 ft. to S and E lines of Lot 1, Sec. 74, A.T.N.C.L. Sur., top Caddo lime with saturation 4,979 ft., T.D. 5,050 ft., 4½-in. 4,976 ft., preparing to drill plug.
Southern Pet. Exp .1 Wilson A, 330 ft. W from railroad and 330 ft. from N line, Lot 4, Sec. 73, A.T.N.C.L. Sur., tight well, top Caddo 5,161 ft., 5½-in. 5,162 ft., show oil in lime 5,161-5,200 ft., flowed 140 bbl. in 7 hr.
Walter Gant 1 Hunter, SE NW Sec. 7, Blk. 1, H.&T.C. Sur., top Ellenburger 5,370 ft., set 7-in. at 5,370 ft., T.D. 5,391 ft., top Caddo 5,133 ft., top Mississippian 5,315 ft., prepare to drill deeper.
Gibson & O'Donohoe 1 Jentsch, 330 ft. from N and E lines, H. Jentsch Sur., Abst. 995, T.D. 4,806 ft., perf. casing 4,171-90 ft., tested water, perf., drilling out cement.
Sam Kruger 1 Turbeville, 450 ft. from E and 389 ft. from S lines, NW Sec. 170, Robert Carson subd., 1,600-ft. test, drilling 1,358 ft.
King Oil 1 Taylor, Lot 1, Sec. 13, A.T.N.C.L. Sur., show oil 4,995-5,020 ft., 5⅛-in. set 4,970 ft., top Mississippian 4,921 ft., top Ellenburger 4,963 ft., prepare to drill out.
H. F. Smiley 1 Larr, SW NW Sec. 136, H.S. of C.R. Sur., 1,400-ft. test, drilling 350 ft.
Adams Oil & Gas 1 Powell, SE Lot 14, Sec. 1, S.P.R.R. Sur., Abst. 406, 5,200-ft. test, spudded and set surface casing.
Deep Oil and Christie 1 G. Moer, SW SW Sec. 21, Clark & Plumb subd., Blk. 3, 4,600-ft. test, first report.
Shappell Oil 15 Lyles, NW NE Sec. 7, Hooper & Wade Sur., Abst. 234, 4,800-ft. test, first report.
W. B. Hamilton 1 C. E. Graham C, SE part of Gibenrath Sur., Abst. 136, 2,000-ft. test, first report.

Baylor County

Hattie B. Madden 2 J. J. James, Sec. 150, T.&N.O. Sur., show oil 1,352-63 ft., lost drill pipe at 2,308 ft., S.D.
Rogers & Lanfair 1 Howe, J. Howe Sur., Abst. 572, show oil 1,445-52 ft., S.D. 3,115 ft., T.D., may drill deeper.
L. T. Burns 1 Burns, Sec. 73, T.&N.O. Sur., 4,500-ft. test, 10-in. 99 ft., drilling 350 ft.

Clay County

Carlos Wagner 1 L. C. Thaxton, Sec. 2, T.&N.O. Sur., 6,500-ft. test, 10-in. 150 ft., waiting on cement.
Petroleum Producers 1 O. O. Ross, Sec. 8, J. Wyont Sur., Abst. 902, T.D. 5,584 ft., pumped 40 bbl. oil and 40 bbl. water in 24 hr. after 5,000 gal. acid, still testing.
Bridwell Oil 1 W. H. Myers, C. Thompson Sur., Abst. 444, 5,500-ft. test, moving in rig.
Akin, Dimock & Costley 1 Patrick, NE SE Sec. 82, 1,200-ft. test, first report.
Gulf 1 C. W. Scaling, NW NW Sec. 31, T.&N.O. Sur., Abst. 685, 6,000-ft. test, first report.
L. T. Burns 1 Southerland, NE cor. of W 100 acres of Sec. 63, J. H. Belcher Sur., 5,500-ft. test, first report.

Denton County

Amon G. Carter 1 W. P. and A. P. Allen, S. Westbrook Sur., drilling 8,500 ft., 10,000-ft. contract depth.

Grayson County

Texas Co. 1 Hutchinson, Samuel Stewart Sur., S.D. 5,545 ft., tight well.

Hood County

W. G. Martin 1 W. G. Thorman, E cor. of 2,956-acre ranch, F. F. Anderson Sur., 5,000-ft. test, spudded and S.D.
Aztec Oil 1 Gallagher, SW SE Robert Alway Sur., 3,000-ft. test, fishing 2,000 ft.

Jack County

Continental 1 Robertson, M. J. Swan Sur., Abst. 1659, top Mississippian 5,307 ft., base Mississippian 5,360 ft., top Ordovician 5,380 ft., drilling 5,467 ft.
R. A. Conkling 1 M. Hoffle, A. James Sur., Abst. 318, 3 mi. S of Antelope, 3,500-ft. test, T.D. 3,108 ft., fishing casing.
Rathke Oil 1 Moseley, J. Harrison Sur., Abst. 259, 1,500 M.c.f. gas 4,645-50 ft., S.D. 5,340 ft.
K. N. Davis 1 Jones, NW cor. E½ Sec. 2555, T.E.&L. Sur., 1 mi. SE Perrin, 2,500-ft. test, moving in rig.
Noah Davis 1 Rankin, E½ Sec. 2555, T.E.&L. Sur., moving in materials.
Three Bee Investment Co. 1 Armstrong, 700 ft. from S and 1,200 ft. from W lines, Sec. 2, W. P. Blake Sur., Abst. 1598, 3,300-ft. test, 6⅝-in. 3,031 ft., show oil 3,031-44 ft., testing.
Harper-McClintock 1 Kinder, 1,400 ft. from E and 467 ft. from N lines, Sec. 2667, T.E.&L. Sur., repairing line at 1,062 ft.
O J. Perrin 1 Brumbelow, 1,045 ft. from S and 720 ft. from E lines, H. C. Ayers Sur., Abst. 4, S.D. 3,505 ft., after electrical survey.
Continental 1 Johnson, N part of D. D. Burton Sur. Abst. 1671, 5,500-ft. test, first report.

Parker County

Higginbotham 1 Gilbert, T.&P. Sur., Abst. 1958, T.D. 4,800 ft., fishing.

Montague County

Walter Gant 1 Will Laird, R. T. Millard Sur., Abst. 470, 7 mi. W of Sunset, T.D. 6,651 ft., P.B. to 6,596 ft., perf. casing 4,865-73 ft., swabbing unit broke, moving out rotary.
J. G. Hammond 1 Jester, 84-acre tract in E. Wingate Sur., Abst. 835, 2 mi. W Mallard, top Caddo lime 6,282 ft., S.D. 6,565 ft.
Sinclair Prairie 1 W. G. Hawkins, 631 ft. from N and 330 ft. from E lines of farm in Sec. 17, H.&T.C. Sur., 3 mi. SE of Ringgold, drilling 4,175 ft.
T. F. Hunter and Wilcox O. & G. 1 Barcus, NE Sec. 78, Kaufman C.S.L. Sur., Abst. 407, 3,600-ft. test, first report.

Tarrant County

Bruce Sullivan 1 W. C. Putnam, 200-acre tract in Milley Gilbert Sur. S.D., may deepen, T.D. 6,512 ft.

Throckmorton County

Homer Moore and J. E. Dodson 1 J. O. Crump, Blk. 956, T.E.&L. Sur., location.
Humble 1 Allie McKnight, 1,100 ft. from N and 660 ft. from E lines, Sec. 2, D.L.&C. Sur., Abst. 1264, 5,000-ft. test, building derrick.
A. B. Bissey 1 W. L. May, NW SW Sec. 916, T.E.&L. Sur., Abst. 322, 610-ft. test, first report.
Humble 1 Durham, NW NW Sec. 1627, T.E.&L. Sur., top Caddo 4,180 ft., top Ellenburger 5,005 ft., T.D.

5,196 ft., set whipstock 3,355 ft., drilling by at 3,559 ft.

Wichita County

Big Six Oil 1 Edmonson, 150 ft. from N and W lines, Sec. 13, Red River Lands subd., drilling 1,510 ft.

Fred Browning 1 W. L. Warren, 996 ft. from N and 330 ft. from W lines, Sec. 32, W.V.F.L. Sur., S.D. 4,001 ft., prepare to P.B. and test show oil 1,760-72 ft., 6⅝-in. 1,760 ft., cleaning out.

Golding & Cochran 1 D. R. Preston B, 2,970 ft. from N and 990 ft. from W lines, Sec. 26, Blk. 7, H.&T.C. Sur., T.D. 4,083 ft., P.B. 3,950 ft., 1,400 ft. oil in hole, preparing to pump.

King Oil 1 Ancell, 330 ft. from N and E lines of L. C. Gibbs Sur., Abst. 390, 4,000-ft. test, show oil 3,600-03 ft., 6⅝-in. 3,000 ft., testing.

R. D. Dorian 1 Ancell, SE Sec. 36, Blk. 5, H.&T.C. Sur. 4,000-ft. test 10-in. 104 ft., 7-in. 4,020 ft., show oil 4,034-49 ft., prepare to test.

Underwood 1 E. D. Owen, SW SW Sec. 49, Specht & McCutchin subd., 1,250-ft. test, first report.

Wilbarger County

W. H. Gant 1 Mock, Sec. 23, Blk. 11, H.&T.C. Sur., 6,000-ft. test, S.D. 440 ft.

Big Six Oil 1 Morris, Sec. 3, Blk. 14, H.&T.C. Sur., show oil 2,895-2,907 ft., 7-in. 2,895 ft., T.D. 2,905 ft., testing est. 60 bbl. oil per day, S.I.

Ray Brothers 1 Henry Streit, 72-acre tract in S. N. Gosnel Sur., Abst. 1231, 1,800-ft. test, 8¼-in. 1,553 ft., prepare resume drilling.

W. B. Omohundro 1 W. T. Waggoner, 1,100 ft. from E and 150 ft. from S lines of Sec. 49, Blk. 4, H.& T.C. Sur., 6⅝-in. 1,229 ft., show oil 1,229-47 ft., tested oil and water, prepare to P.B. to test.

Wise County

Cranfill & Rogers 1 McKay, Sec. 8, Falls C.S.L. Sur., T.D. 7,154 ft., prepare to test show oil 6,940-80 ft., top Ordovician 6,865 ft., top Ellenburger lime 7,005 ft.

Manahan Oil 1 E. R. Collier, J. M. Wade Sur., Abst. 868, contract depth 7,500 ft., prepare to drill ahead below 6,047 ft.

Young County

E. Lennington 1 Perry, 165 ft. N of C of river and 46 ft. from W line of 126-acre A. W. Perry farm in Oliver T. Brown Sur., Abst. 25, S.D. 165 ft.

Ben H. Rankin 1 Mary Logan, SW part Blk. 2, J. W. Doty Sur., 8 mi. NE Graham, 2 mi. W Nelson field, drilling 3,890 ft.

B. C. Gilmore 1 Bagley, 210 ft. from E and 650 ft. from S lines of Leroy W. Ross Sur., Abst. 1352, 700-ft. test, rigging up spudder.

L. T. Burns 1 Bloodworth, 150 ft. from N and 783 ft. from W lines of Sec. 214, T.E.&L. Sur., 1,000-ft. test, location.

S. D. Glover 1 C. E. Luton, 150 ft. from S and E lines of J. L. Elmore Sur., Abst. 1421, drilling 725 ft.

Dorian & Farrell 1 Grigsby, Sec. 416, T.E.&L. Sur., Show oil 3,974-79 ft., casing set 3,974 ft., moving in spudder to test.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Jan. 27.—Fisher County's new McCaulley field was given another new outpost location during the week to boost the total to three active tests in the area, all some 2 miles apart. The discovery well, Stephenson 1 Maberry, SE SE Section 56, Block 1, H.T.&B. Survey, just 1¼ miles south of McCaulley, is still testing. The pay section is in saturated Swastika sand drilled from 3,285 to 3,302 ft. Several weeks ago the well was opened after being shut in for about a month and flowed 57 bbl. of oil in 1 hour. It was deepened to 3,315 ft., total depth, without much increase in oil output. The pay section was given a light shot and responded with a swabbing gage of 90 bbl. of 43-gravity oil in 9 hours. At last reports swabbing was still under way.

About 1¼ miles south of the discovery well Stephenson is drilling below 2,000 ft. in 1 Humphries, NW NW Section 49, same block and survey. The new location for the area is P. R. Long 1 W. F. Davidson, SE NW Section 59, same block and survey, about 2½ miles northwest of the discovery and about 1 mile west of McCaulley. The trend of the yet-unexplored structure will be partially determined by the results of the two outpost tests.

In Shackelford County the Fortex Oil Co. has staked a new north outpost to the Ivy field. It is 1 J. S. McKeever, 467 ft. from the north and west lines of NE NW Section 14, Block 3, H.&T.C. Survey, about a mile northeast of production in the field. It is about ½ mile northeast of a test drilled by the same company some 2 years ago which showed for an estimated 50 bbl. daily in the Strawn series below the Ivy field's Palo Pinto lime producing level. The test later developed water and was quit.

WEST CENTRAL TEXAS COMPLETIONS

Callahan County

Wildcat: Rhodes Drilling Co. and A. R. Forster 1 George, NW NW Sec. 75, B.O.A. Sur., show oil 2,140-50 ft., 1,500 gal. acid and 30-qt. shot, no results, dry at 2,641 ft.

Coleman County

Stewardson field: A. W. Adkisson 6 Stewardson, 15 bbl., pumping, 10-qt. shot, 1,677-87 ft.

Jones County

Lewis field: Petroleum Producers 5 Bryant-Link, 279 bbl., 6,000 gal. acid, 1,861-72 ft.

Akard field: Hendrick Oil 1-C Akard, 128 bbl., open tubing, 2,113-29 ft.

(Continued on Page 223)

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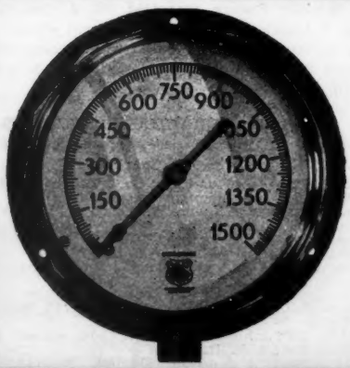

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ASHCROFT GAUGES MM MANNING, MAXWELL & MOORE, INC. BRIDGEPORT, CONNECTICUT

Two New Areas Opened in Ector; Gas Field in Menard

By R. MARNE SANFORD

MIDLAND, Tex., Jan. 27.—Holding top interest in West Texas at the close of the week were the discovery of two new oil areas in Ector County, one already officially completed and the other still testing, and the opening of a new gas reserve in Menard County. Also topping interest of the week was the purchase by Stanolind Oil & Gas Co. of the recent Simpson sand discovery well in northern Pecos County of Taubert-McKee-Siemoneit.

The already completed discovery well for Ector County, one which opens a new pay for the county, is Stanolind 3-A Midland Farms, located on the east side of the North Cowden field and in the SW NW Section 46, Block 42, Township 1n, G.&M.M.B.&A. Survey. The test was completed for 272 bbl. of oil daily, pumping, after a 375-qt. shot from 4,465 to 4,621 ft. The new pay is approximately 175 ft. below the base of the regular Big lime pay in the North Cowden field and is also about 700 ft. above the Holt lime pay of the west side of the North Cowden field. With the new pay not being yet definitely identified, it is tentatively placed in the lower part of the Double Mountain series of middle Permian age. The well has been in the testing stage for several weeks. No further development has been indicated for the area as yet.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Southern West Texas			
Oil wells: Ector County	8	6,905	33,965
Keystone field	2	558	6,590
Other fields	4	1,529	9,152
Gas wells: Noelke field	2	*42.5	3,085
Dry holes: Wildcats	2	.....	654
Fields	3	.....	7,102
Total	21	.....	60,548
Old well drilled deeper	1	.....	2,173
Northern West Texas			
Oil wells: Seminole	2	1,623	10,675
Slaughter	6	5,202	30,012
Wasson	4	3,115	20,982
Other fields	3	453	10,146
Total	15	.....	71,815
Texas Panhandle			
Oil wells: Skellytown field	2	582	6,193
Pampa field	2	415	6,141
Borger field	4	933	12,000
Other fields	3	883	8,231
Total	11	.....	32,565
Southeast New Mexico			
Oil wells: Grayburg-Jackson	2	640	6,870
Ginsberg field	2	45	6,917
Other fields	2	1,080	4,369
Dry holes: Wildcat	1	.....	1,200
Fields	2	.....	4,685
Total	9	.....	24,041

*Million cu. ft.

Embar Discovery

Ector County's other discovery, still testing, is Phillips 1-A (formerly 1-22) Embar, SW SW SW Section 6, Block 44, Township 1n, T.&P. Survey, about 3 miles due east of the North Goldsmith field and about 3 miles south of the same company's discovery gas well of early September 1940. Whether this oil discovery will prove to be on the flank of the structure indicated by the gas discovery or not, is not as yet determined. However, the oil in the new well was encountered slightly lower, structurally, than the gas zone in the discovery to the north. Treated with 1,000 gal. of acid at a total depth of 4,312 ft. 1-A Embar flowed 21 bbl. of oil in 24 hours through 14/64-in. choke. At last reports another acid treatment of 1,500 gal. was scheduled for the test. The original gas discovery for the area is located in NW NW Section 5, Block 43, Township 3s, T.&P. Survey, in southern Andrews County. An oil horizon was found in this test. However, it was completed for 3,000,000 cu. ft. of gas daily to furnish fuel for the drilling of other exploratory tests which the company then planned for the area.

Menard Gas Discovery

Harry Baldwin 1 Leggett, SW SW Section 1, B.S.&F. Survey, in Menard County, encountered a gas-bearing zone at 1,250 ft. and after penetrating only 1 foot gaged 1,000,000 cu. ft. of gas daily. The 5½-in. casing has been set at 1,201 ft. and completion is scheduled for early the coming week. The well will furnish the city of Menard with gas, an estimated 20,000,000 cu. ft. needed monthly. The discovery operator's agreement with the landowner calls for another test within a year. However, it is believed it will start within a short while. The Rio Gas Co. is preparing to lay a 2-in. line from the discovery to the town of Menard 8 miles to the southwest.

Pecos Discovery Sold

After several companies had their bids turned down for the purchase of the Taubert-McKee-Siemoneit 1 Crockett, discovery well in Pecos County, Stanolind definitely closed a deal for the purchase of the discovery well and the discovery firm's 3,140 acres in small tracts around the well. Consideration was $380,000 cash, with no overriding royalty and no oil payment. The discovery well was completed late in December of 1940 for 929 bbl. of 43-gravity oil in 11 hours and 23 minutes from Simpson (Middle Ordovician) at 5,357 ft.

Announced at the same time as the discovery-well acquisition was the Stanolind's purchase of an additional 3,060 acres from George T. Abell. The purchase included all of the holding of the old Tex-Oil Co., of which Abell is the head. Included in this acreage deal was the obligation to start a 6,000-ft. test by the middle of February. Location was not announced for the test.

New Wildcat Tests

There were two new wildcat tests located during the week and a third previously staked test begun. The active operation is in Sutton County and is W. M. Lyle 1 C. D. Wyatt, NE NE Section 4, Block 6, T.W. &N.G. Survey. It is a scheduled 4,500-ft. test and is about 5 miles north of Camp Allison.

In Loving County C. T. McLaughlin, contractor, was preparing to spud Pinal Dome Oil Co. 1 Michigan Oil & Gas Co. It is located in the NW Section 15, Block 26-C, P.S.L. Survey, about 14 miles northeast of Mentone in the northeast part of the county. Contract depth is set at 5,300 ft. or the Delaware lime.

In Winkler County Stanolind Oil & Gas Co. has staked 1 American Maracaibo, a wildcat about 2 miles south of the Henderson field and an equal distance north of the Hendricks field. It is in the SE NW Section 19, Block 26, P.S.L. Survey.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hour ratings based on last 3 hours of 6-hour gage)

Crockett County

Noelke field: M. & M. Drilling Co. 1 Bouscaren, 40,000,000 cu. ft. gas, open casing, 1,512-55 ft.
Henry Schooler 1 Noelke, 2,500,000 cu. ft. gas, open casing, 1,395-1,530 ft.
Soma Oil 1 W. T. Noelke, 129 bbl. in 4 hr., with 19,280,000 cu. ft. gas, 1,057-75 ft. (discovery well in Noelke field just now reporting official gage).

Ector County

Johnson field: Atlantic 7-A Johnson, 745 bbl., open tubing, 580-qt. shot, 4,095-4,250 ft.
I.T.I.O. 3-F Johnson, 791 bbl., 1-in. choke, 200-qt. shot, 4,067-4,152 ft.
Mid-Continent 1 Johnson, 474 bbl., 30/64-in. choke, 450-qt. shot, 4,256-4,381 ft.
North Cowden field: Rhodes-Tompkins 4 Maurice, 403 bbl., pumping, 270-qt. shot, 4,115-4,310 ft.
Rhodes-Tompkins 5 Maurice, 653 bbl., pumping, 370-qt. shot, 4,175-4,306 ft.
Stanolind 3-A Midland Farms, 272 bbl., pumping, 375-qt. shot, 4,465-4,621 ft.
Foster field: Richmond 2 Smith, 2,292 bbl., natural, open casing and tubing, 4,046-4,151 ft.
Jordan field: Texas 6 McDonald, 1,275 bbl., open casing, 1,220-qt. shot, 3,385-3,695 ft.

McCulloch County

Wildcats: A. K. McCord 1 Eubanks, J. Minor Sur. 45, dry at 323 ft.
A. K. McCord 1 Nelson, Sec. 959, Blk. E, Gruene Sur., Abst. 957, dry at 331 ft.

Pecos County

White & Baker field: Cheyenne Pet. (was Frank Hynes) 1 White & Baker, 108 bbl., open tubing, 60-qt. shot, 2,068-99 ft., P.B. from 2,123 ft.
L. C. McKean 1 Breene, dry at 1,944 ft., sulfur water.

Upton County

McCamey field: Shell 12 Bowen, old well drilled deeper, new T.D. 2,173 ft., new initial 347 bbl., 33 bbl. water, pumping, 1,000 gal. acid.
McElroy South Extension area: Texas Pacific 3 Eddleman, 488 bbl., open tubing, 980-qt. shot, 2,990-3,176 ft.

Ward County

Ward field: M. A. Black 1 fee, dry at 2,215 ft., not plugged.
O'Brien field: Gulf 159 O'Brien, 159 bbl., open tubing, 470-qt. shot, 2,584-2,778 ft.

Winkler County

Hendrick field: W. A. Hudson 1 Hendrick, dry at 2,943 ft.
Keystone field: C. A. Jones 2 Lovett, 110 bbl., ¾-in. choke, 640-qt. shot, 3,050-3,264 ft.
Ralph Lowe 4 Campbell, 448 bbl., tubing, 530-qt. shot, 3,145-3,326 ft.

SOUTHERN WEST TEXAS WILDCAT REPORT

Crane County

Gulf 1-F University, SE SE Sec. 22, Blk. 31, University Sur., drilling 9,048 ft.
Gulf 17 Waddell, Sec. 13, Blk. 3, H.&T.C. Sur., 4 mi. S of Sand Hills field, 12½-in. 138 ft., T.D. 1,435 ft., W.O.C.

Culberson County

Cecil Cothrun 1 Casey-Rounsoville, Sec. 7, Blk. 104, P.S.L. Sur., S.D. 1,271 ft., bailed some free oil.

Crockett County

Moore & Olson 2 Noelke, 495 ft. from N and 2,548 ft. from W lines, Sec. 77, Blk. GG, T. W. Carter Sur., T.D. 1,217 ft., flowed 25 bbl. per hr., S.I.
I. T. I. O. 1 Roy Henderson, NW SE Sec. 33, Blk. ST, 2,000 ft., digging pits.
Geo. T. Morris 1 Brock Hoover, SW SE Sec. 99, Blk. 1, I.&G.N. Sur., 2,000-ft. test, drilling 191 ft.

Ector County

Stanolind 1-B W. F. Cowden, SE W½ Sec. 12, Blk. 44, Twp. 1n, T.&P. Sur., deep Holt lime test, drilling 5,084 ft.
Cities Service 1 F. V. Addis, SW SE Sec. 34, Blk. 43, Twp. 2s, T.&P. Sur., building derrick.
Phillips 1-22 Embar, Sec. 6, Blk. 44, Twp. 2n, T.&P. Sur., T.D. 4,312 ft., 1,000 gal. acid flowing by heads, preparing to re-treat.

Loving County

H. C. McAuley 1 E. Hall, SE Sec. 60, Blk. 7, W.&N.W. Sur., 8¼-in. 1,712 ft., drilling 2,392 ft.
Sloan & Zook 1 T.&P. Trust, SW SE Sec. 37, Blk. 56, Twp. 1s, T.&P. Sur., 3¾ mi. NE of Tunstill gas well, top anhydrite 500 ft., 8¼-in. 2,414 ft., drilling 2,500 ft.

Pecos County

Culbertson & Irwin 1 R. G. Heiner, NE NE Sec. 589, G.C.&S.F. Sur., Ordovician wildcat, show oil in upper Ellenburger lime, drilling 5,635 ft.

Schleicher County

Harold B. Opp 1 Jackson, Sec. 41, Blk. LL, T.C. Sur., drilling 5,887 ft.

Reagan County

H. Schooler 1 R. A. Wolters, NE NE Sec. 51, G.C.&S.F. Sur., S.D. 20 ft.

Reeves County

C. A. Kitsos 1 A. B. Burchard, SW Sec. 7, Blk. 58, P.S.L. Sur., Delaware test, spudded and S.D., drilling water well.
Roy Johnson 1 Perkins, Sec. 18, Blk. 7-C, P.S.L. Sur., drilling 1,761 ft., corrected.
J. T. Pemberton 1 fee, NE NE Sec. 2, Blk. 55, Twp. 7, T.&P. Sur., first report, Delaware lime test, 7,000 ft., location.

Sutton County

S. B. Roberts 1 George Allison, NW NE Sec. 44, Blk. K, G.H.&S.A. Sur, S.D. casing 740 ft.
Domain 1 G. S. Allison, SW NE Sec. 91, Blk. 9, T.W. N.G. Sur., Ellenburger lime test, S.D. 1,098 ft., last report.

Terrell County

Texas Consolidated Oil 1 Holmes, NE NE Sec. 14, Blk. 2-A, G.H.&S.A. Sur., 3,600-ft. test, running 8-in. casing at 1,000 ft., T.D.
H. H. Sides 1 Rose, Sec. 15, Blk. 148, T.&St.L. Sur., T.D. 420 ft.
E. M. Thomasson 3 Bates-Graham, 600 ft. from N and 2,490 ft. from W lines, Sec. 30, Blk. 1, I.&G.N. Sur., S.D. 360 ft., corrected.

Ward County

Fitzpatrick & Slack 1 Wilson, Sec. 145, Blk. 34, H.& T.C. Sur., 1½ mi. SE of discovery well, tools lost in hole at about 4,700 ft., T.D. 4,925 ft., S.D. for casing.

Gulf 6 Wristen 1,997 ft. from SE and 1,989 ft. from NE lines, Sec. 18, Blk. 5, H.&T.C. Sur., deep Silurian test, drilling 696 ft.

Roeser & Pendleton, Inc., and Merry Brothers & Perini 1 Bird Hayes, 467 ft. from SE and SW lines, Sec. 164, Blk. 34, H.&T.C. Sur., ¼ mi. N of discovery gas well, contract depth 5,200 ft., to Delaware sand, 10-in. 1,072 ft., drilling 4,103 ft.

J. E. Fitzpatrick 1 T. B. Pruit, SW SW Sec. 23, Blk. 1, W.&N.W. Sur., T.D. 105 ft., R.U.R.

NORTHERN WEST TEXAS

Several wildcat or exploratory tests held the attention in the North Permian basin at the close of the week. In the Wasson field of Gaines County Amon G Carter 4-D Wasson, an 11,000-ft. contracted test, was reported drilling below 10,050 ft. in an unreported formation. It is located in NW SE Section 50, Block AX, P.S.L. Survey.

In Cochran County and west of the Duggan field Atlantic Refining Co. and Rhodes Drilling Co. are still attempting to shut off bottom-hole water in 1 Dean, C NE Section 4, League 89, Lipscomb C.S.L. Survey. Total depth is 5,150 ft., first plugged back to 5,112 ft. and treated with 1,000 gal. of acid and shot with 210 qt. and again plugged back, this time to 5,099 ft. However, water is still showing.

Attempting to extend the Cedar Lake field 1 mile to the south, San Andres Production 1-A Johnson, outpost test in Section 6, Block 30-C, P.S.L. Survey, was drilling below 8⅝-in. casing seat at 1,990 ft. after topping the upper markers favorably. The anhydrite was topped at 1,980 ft., some 29 ft. higher than an east-side producer in the field proper.

NORTHERN WEST TEXAS COMPLETIONS

(24-hour ratings based on last 3 hours of 6-hour gage)

Gaines County

Seminole field: Amerada 1 Lamb, 793 bbl., ½-in. choke, natural, 5,097-5,305 ft.

Amerada 3-A Mathews, 830 bbl., ½-in. choke, natural, 5,143-5,370 ft.

Cedar Lake field: Stanolind 1 Hall, 159 bbl., 3 per cent water, pumping, 1,060-qt. shot, 4,605-4,817 ft., P.B. from 4,825 ft.

Hockley County

Slaughter field: Geo. Livermore 3 Glimp, 1,440 bbl., open casing, 9,500 gal. acid, 4,997-5,034 ft.

Magnolia 4-G Mallett, 842 bbl., open tubing, 10,500 gal. acid, 4,950-5,011 ft.

S. W. Richardson 2 Denton, 634 bbl., open casing, 8,000 gal. acid, 4,878-4,979 ft.

S. W. Richardson 9 Slaughter, 665 bbl., open casing, 8,000 gal. acid, 4,890-4,998 ft.

Texas 13 Slaughter 765 bbl., open casing, 11,000 gal. acid, 4,909-5,005 ft.

Texas 14 Slaughter, 856 bbl., open casing, 10,000 gal. acid, 4,912-85 ft.

Howard County

Snyder field: C. T. McLaughlin 2 Snyder, 127 bbl., pumping, 250-qt. shot, 2,700-2,825 ft.

Scurry County

Sharon field: Ordovician Oil 2 Alliance Trust, 167 bbl., pumping, 220-qt. shot, 2,469-96 ft.

Yoakum County

Wasson field: Aloco Oil 9-B Miller, 703 bbl., open tubing, 10,000 gal. acid, 5,050-5,206 ft.

Don Danvers 4 Bennett, 944 bbl., open tubing, 10,000 gal. acid, 5,052-5,286 ft.

Don Danvers 9 Willard, 723 bbl., 9,500 gal. acid, 5,065-5,260 ft.

Shell 7 Hodges, 745 bbl., ¾-in. choke, 10,000 gal. acid, 5,025-5,230 ft.

NORTHERN WEST TEXAS WILDCAT REPORT

Andrews County

Phillips 1 University-Drews, NW NE Sec. 32, Blk. 10, University Lands Sur., drilling 5,167 ft.

Phillips 2 Embar, NE SE Sec. 5, Blk. 44, Twp. 2n, T.&P. Sur., ¾ mi. N of Embar, drilling 5,336 ft.

Furham Pet. 1 Lockhart-Brown, Sec. 24, Blk. 42-A, P.S.L. Sur., top solid lime 4,155 ft., T.D. 4,700 ft., new contract depth 6,500 ft., top anhydrite 1,685 ft., Yates quartz 4,140 ft., San Andres 4,405 ft.

Cochran County

Rhodes and Atlantic 1 Dean, C NE Tract 4, Lge. 89, Lipscomb County School Lands, T.D. 5,150 ft., P.B. 5,112 ft., treated with 1,000 gal. acid, shot 210-qt. P.B. to 5,099 ft., water not shut off, still testing.

Gaines County

Amon G. Carter 4-D Wasson, NW SE Sec. 50, Blk. AX, P.S.L. Sur., logged new pay about 6,610 ft., tight well, application filed to drill to 11,000, drilling 10,050 ft.

W. E. Smith 1 fee, in Lots 11 and 12, Blk. 38, in Seminole townsite, 1¼ mi. E of Seminole field, building derrick.

King County

J. B. Cunningham 1 F. W. Thormann, NE NE W. C. Browder Sur., drilling 1,680 ft., 3,000-ft. test, last report.

Mitchell County

Peck & Croft 1 Jack Smith, 2,173 ft. from N and W lines, Sec. 19, Blk. 26, T.&P. Sur., 10¾-in. 492 ft., drilling 525 ft.

Yoakum County

George Livermore 1 Ownby, NE NE NE Sec. 502, Blk.

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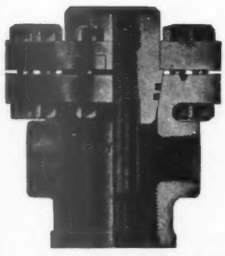

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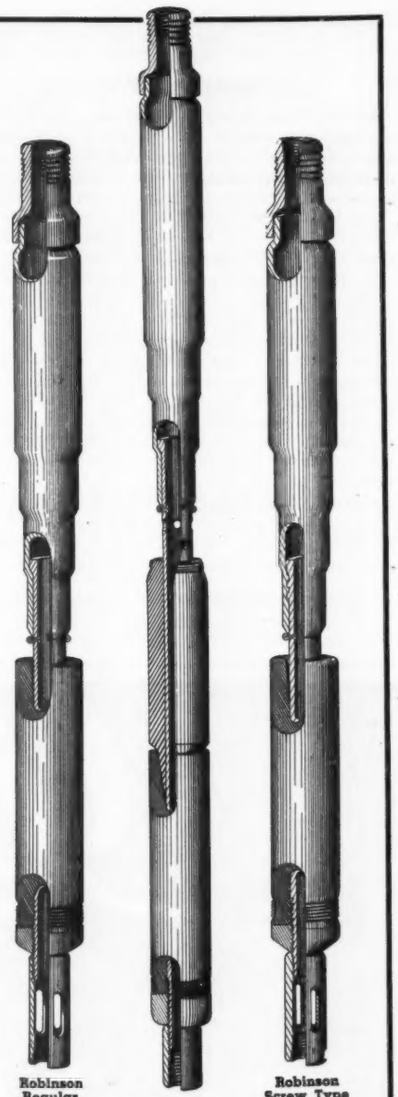

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D. Gibson Sur., top anhydrite 2,510 ft., Yates quartz 3,390 ft., Brown lime 4,330, San Andres 4,690 ft., 5½-in. 4,921 ft., waiting on tools. T.D. 5,040 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M., Jan. 27.—The staking of a new wildcat location in western Eddy County west of Lake McMillan, together with the gaging of two small outpost producers for the Ginsberg field, held attention in the Southeast New Mexico district during the past week.

The location was Olin F. Featherstone 1 Merchant, C NE NW Section 10-19-26, west of Lake McMillan and about 2 miles south of the Dayton field.

In the Ginsberg area, one northwest outpost was gaged and another completion was registered in the area between the Ginsberg field and the Shugart field to the south, they being in the linking process. About a mile northwest of the field, Wilmar Oil 1-B Ginsberg was gaged at 15 bbl. daily, swabbing and flowing, after a 200-qt. shot from 3,135-76 ft., total depth. Between the two fields and just northeast of a lone link producer, Fullerton 3-B Little, C SW SW Section 21-18-31, was gaged at 30 bbl. daily, pumping, after a 390-qt. shot from 3,576 to 3,741 ft.

New completions in the district were limited to Eddy County, alone, however, that county registered a total of six new oil wells and three failures. New locations were five in Eddy County and two in Lea County.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

Grayburg-Jackson field: Danciger 8-A Turner, C SW SE 18-17-31, flowed 160 bbl. in 8 hr., 1,000 gal. acid, 3,376-3,448 ft.

Danciger 9-A Turner, C N½ NW NE 19-17-31, flowed 160 bbl. daily, 3,000 gal. acid, 3,368-3,422 ft.

Loco Hills field: Allen-Pope-Fair 1-C State, SW NE NW 2-18-29, flowed 60 bbl. in 3 hr., 225-qt. shot, 2,645-2,730 ft.

Ginsberg field: Wilmar Oil 1-B Ginsberg, C SE NW 7-18-31, swabbed and flowed 15 bbl. daily, 200-qt. shot, 3,135-76 ft.

Fullerton 3-B Little, C SW SW 21-18-31, pumped 30 bbl. daily, 390-qt. shot, 3,576-3,741 ft.

Shugart field: Carper 3-A McFaddin, NE SE NW 3-19-31, dry at 2,695 ft., water.

Willis field: Neil Willis 3-A Keyes, C NW SE 15-20-30, pumped 300 bbl. in 12 hr., natural, 1,591-1,639 ft.

Dayton field: Bassett-Birney 1 Kimbell, SE SE SE 26-18-26, dry at 1,990 ft., after 350-qt. shot, with no results.

Wildcat: S. P. Yates 1 Ross, SE NW SW 22-19-25, dry at 1,200 ft., water.

SOUTHEAST NEW MEXICO WILDCAT REPORT

Chaves County

L. E. Elliott 1 State.....NW NE 16-11-31
Drilling 885 ft.

Roxana Oil 1 Maull.....NE NW 11-12-25
S.D. 460 ft.

A. F. Pierce 1 Franks.....SE NW NW 17-9-25
Show oil 862-67 ft., treated 1,000 gal., T.D. 938 ft., S.D.

Helmes-Martin 1 Stephens.....C NW NE 22-15-29
Old well drilling deeper, drilling 3,195 ft.

H. Steinberger 1 Headley.....NW SW 26-14s-29e
T.D. 3,405 ft., sulfur water 3,400-05 ft.

R. I. Wilson 1 L. B. Brown.....C NW SW 29-11-23
S.D. 235 ft.

Eddy County

G. M. Cone 1 Hare.....NW NW NE 14-16-28
Old well drilling deeper, T.D. 1,800 ft., est. 100,000 cu. ft. gas showing, S.D.

A. & M. Pet. 2 State.....NW SE 15-21-27
T.D. 583 ft., cleaning out.

Mac T. Anderson 1 Brainard.....NE NE 28-18-27
S.D. 2,056 ft.

Bedingfield & Walker 1 Seale.....SE SE SE 10-20-27
T.D. 1,620 ft., fishing bit.

Jack Harris Josey.....SW SE 19-20-23
T.D. 643 ft.

Jones & Yates 1 Everest.....NE SE 15-18-26
270-qt. shot 1,934-84 ft., and 670-qt. shot 1,485-1,710 ft., casing collapsed, squeezed off casing, waiting on cement.

Fulton 1 Johnson.....NW SE 22-19-27
T.D. 1,849 ft., P.B. 1,645 ft., 230-qt. shot 1,752-1,645 ft., filled 400 ft. with oil and water after being cleaned out, 5⅞-in. casing at 1,442 ft., swabbed 27 bbl. oil, 5 hr., pumped 20 bbl. daily.

Truett & Tallmadge 1 Rudahl.....NE SE 2-20-24
Recementing split casing at 540 ft., T.D. 1,842 ft.

Dooley & Haynes 1 Martin.....SE NW 9-18-25
5½-in. at 975 ft., S.D. 1,000 ft.

Otero County

Otero Oil 1 State.....SE NW 5-22-10
Reaming 8¼-in. at 1,190 ft., T.D. 1,240 ft.

R. H. Ernest 1 Located Land Co.....SE SE 20-25-7
T.D. 3,843 ft.

TEXAS PANHANDLE

AMARILLO, Tex., Jan. 27.—A total of 11 new oil completions were filed in the Panhandle fields during the past 7-day period, aggregating a total new potential of 2,913 bbl. daily. New locations in the district totaled 11, the Skellytown field in Carson County counting two, the Pampa field in Gray getting three, and the Stinnett and Borger fields in Hutchinson County receiving three each.

TEXAS PANHANDLE COMPLETIONS

(24-hour pumping gages)

Carson County

Skellytown field: Clayton & Dwyer 4 Schafer, 300 bbl., 3,082-3,105 ft.
Skelly Oil 112 Schafer, 282 bbl., 3,025-88 ft.

Gray County

Pampa field: Magnolia 1 Hood, 299 bbl., 3,000-65 ft.
Wilcox Oil & Gas 46 Combs-Worley, 216 bbl., 2,945-3,076 ft.

Lefors field: Magnolia 7 Saunders, 289 bbl., 2,820-2,920 ft.

Hutchinson County

Stinnett field: W. H. Ingerton 1 Jasper, 567 bbl., 3,050-3,150 ft.

Borger field: Skelly 11 Watkins B, 230 bbl., 2,765-2,870 ft.
Shell 8-B Harvey sisters, 330 bbl., 3,012-64 ft.
Phillips 49 Cockrell, 181 bbl., 2,988-3,076 ft.
Phillips 13 Jordan, 192 bbl., 2,920-90 ft.

Wheeler County

Shamrock field: J. P. Ledford 1 Locke, 27 bbl., 2,157-61 ft.

Forest City Basin

(Continued from Page 201)

some of the wells no longer being profitable to operate because of water.

Both north and south of Humboldt, in western Richardson County, much interest was centered on wildcat tests. Two miles west of Humboldt, J. E. Palensky, of Vermillion, S. D., announced his test, a mystery well, had good showings in the Hunton lime. He was waiting on cement. Two miles south of Humboldt, McNulty & Bass ran a Schlumberger test at 1 Cander and the log indicated both Hunton and Viola showings. Viola was topped at 2,605 ft. Pipe was being run for a test.

There is no Viola lime production in Nebraska to date. The McNulty-Bass well would start an interesting play with a Viola strike.

In the Shubert area there was more activity than for many weeks. The Indian Territory Illuminating Oil Co. announced it was going back to deepen 1 Bankers Life in NE SE 3-2n-15e to Viola lime. The I.T.I.O. also announced location for 1 Schaible, C SW SW 29-3n-16e, a southwest diagonal offset to its 1 Schaible-Kuttler producer. The producer as yet has had no extension. Garetson & Knisely, of Douglas, Wyo., set surface pipe at their 1 J. S. Parsons in SW SW 30-3n-16e.

Nemaha County, Nebraska, was quiet. Little was under way in Missouri because of the weather and the same held true for Iowa. Title and other difficulties have added to delays in Missouri and Iowa.

In Leavenworth County, Kansas, C NE NE 27-10s-20e, in the McLouth area, Dan McLaughlin, of McLaughlin Sons., Inc., announced he would run pipe for a Wilcox sand test at 1 Thorp, in which he reported some free oil. Little else of consequence was happening in northeast Kansas because of bad weather.

NEBRASKA COMPLETIONS

Richardson County

Falls City pool: Pioneer Oil 1 Boice, NE NW NE 18-1-16, pumped 150 bbl., Hunton 2,269-78 ft.

Wildcat: Pioneer Oil 1 Hough-Hill, SE SW 6-1-16, dry, T.D. 2,514 ft., Lansing 919 ft., Misener 2,500 ft., Hunton 2,506 ft., water.

FOREST CITY BASIN DRILLING REPORT

NEBRASKA

Richardson County

Ohio 6 Sandrock.....SW NW NE SE 20-1n-16e
Hunton 2,248 ft., drilling plug.

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MID-CONTINENT AND GULF COAST REPRESENTATIVE: Westcott & Greis, Inc., Tulsa, Dallas and Houston. WEST COAST REPRESENTATIVE: Bert W. Paul, Los Angeles.

J. E. Palensky 1 Kaulous .....SW SW 5-2n-13e
Waiting on cement for Hunton test, tight hole.
McNulty & Bass 1 Cander.....C SW SW 15-2n-13e
Viola 2,605 ft., log shows stains, running pipe to test.
I.T.I.O. 1 Bankers Life.....NE SE 3-2n-15e
Old well drilling deeper, Hunton 2,418 ft., old T.D. 2,472 ft., to drill to Viola.
W. H. Martgan 1 Smith .....C NW NW 31-3n-16e
Hunton 2,513 ft., T.D. 2,539 ft., set pipe and waiting for test.
Pioneer Drilling 1 Hill-Hough.....SE SW 6-1n-16e
Dry.
McNulty & Bass 1 Cander.....SW NW SW 15-2n-13e
8⅝-in. 61 ft., base Kansas City lime 1,197 ft., drilling 1,765 ft.
Garretson & Knisley 1 Bankers Life Ins. .....
SW SW 30-3n-16e
T.D. 65 ft., will rig up rotary.

Nemaha County

Turner & Keiker 1 Kiechel.....NE NE SE 4-5n-13e
Location abandoned.
Bow & Arrow 1 Wrightsman..W½ SW NW 36-6n-14e
S.D. 800 ft.

Otoe County

John Findeiss & Ziegler 1 Ritter....NE NE 26-7n-12e
First report.

Cass County

Golden Rod 1 Sporrer.....SE SE SE 8-11n-13e
Rotary at 1,240 ft., St. Peter 1,329 ft. with stain in top, granite 1,354 ft. (est.), S.D. 1,356 ft.

KANSAS

Jefferson County

G. A. Caufield et al 1 Ragan.....SW SE 19-10s-20e
8-in. at 950 ft., S.D. 970 ft.
McCain & Sherrod 1 Greene.....SW NW 9-11s-19e
S.D. at 1,200 ft. for 6-in. casing.

Leavenworth County

McLaughlin Sons 1 Thorp ..... C NE NE 27-10s-20e
Wilcox 2,088 ft., show of oil, to run pipe and test.

Johnson County

McCain & Sherrod 1 Doan CEL NW SE 34-12s-22e
Slight show 1,695 ft., cleaning out.

Nemaha County

Ladd & Vincent 1 Achten .....CSL SE NW 12-4s-14e
Water 1,945-50 ft., H.F.W. 1,965-75 ft., S.D. 1,992 ft.

Brown County

Gernon & MacAlpine 1 Tyler.....NE SW SW 4-3s-15e
H.F.S.W. 810-60 ft., drilling at 995 ft.

MISSOURI

Holt County

J. Flory 1 Meyer.....SE NE NW 27-62n-39w
12-in. 170 ft., H.F.W. 695 ft., S.D.

Atchison County

Jackson & Rust 1 Hays.....NE NE 22-66n-42w
Topeka 277 ft., S.D. 310 ft.

IOWA

Fremont County

J. B. Barnes 1 Lucas.....SW NE SE 28-70n-43w
Hunton 1,095 ft., S.D. 1,097 ft.

Taylor County

Smythe McLaughlin & Comfort 1 Hook.....
NE NW 18-69n-35w
T.D. 1,100 ft., lost hole, skid rig 75 ft. east.

Oklahoma Fields

(Continued from Page 211)

Continental 1 Cronan.....NW NE SW 23-28-3
Layton 2,280-2,405 ft., dry, show oil 2,787-2,802 ft., show oil 2,820-25 ft., show oil and water 2,830 ft., show oil 2,860-70 ft., coring 2,940 ft.

Lincoln County

K. G. F. F. 1 Adams.....SW NW NW 3-14-4
Brown lime 4,400 ft., Mayes 4,510 ft., drilling 4,762 ft.
Mid-Continent 1 School land.....NW NE NW 36-12-3
Brown lime 4,750 ft., drilling 4,892 ft.

Noble County

Adams 1 Albright.....SW SW SE 31-23-2w
S.D. 910 ft.
Elson & Hudson 1-A Conway.....NE NE NE 16-23-2w
Oswego 4,083 ft., lime 4,365-85 ft., dolomite 4,375-85 ft., show oil, drilling 4,410 ft. in lower Pennsylvanian.

Okfuskee County

Shell 1 Davis.....SW SW SW 18-13-9
Perf. 2,940-66 ft. in Hunton, dry, acid, swabbed salt water, S.D.
Burke-Greis 1 Mullins.....SW SE SE 5-10-10
Drilling 1,615 ft.
Carte 1 Bucco.....NE NE SE 20-10-12
S.D. 1,999 ft.

Oklahoma County

Harper-Turner 1 Harper.....NW NW SW 17-14-2w
S.D. 5,882 ft.

Payne County

Big Chief 1 Strange.....SW SE 27-18-4w
S.D. 5,127 ft., 2,800 ft. water in hole.
H. & H. Oil 1 Linsenmeyer.....SE SE SW 3-18-4
T.D. 3,956 ft., reaming down 2,800 ft. to set pipe.
W. F. Eppler 1-A McBirney .....SW SW 12-17-13
10-in. 44 ft., Oswego 510-20 ft., drilling 550 ft.

Pontotoc County

Alma 1 Norris.....NE NW SW 22-4-4
Drilling 500 ft.

Pottawatomie County

Kerlyn 1 Cherry.....SE NE NW 32-8-5
Deepened 4,328 ft. to 4,330 ft., swabbed 155 bbl. in 10 hr., bailed 3 bbl. water per hr. off bottom, P.B. 4,325 ft., lead wool, oil rose 2,300 ft., cleaning out to acidize.
O'Conner & Townsend 2 Lynn.....NE NE NW 28-6-4
T.D. 70 ft., surface pipe.

Seminole County

Delaney and Atlantic 1 Clark.....NE NE SE 30-8-7
7-in. 4,282 ft., fill 500 ft. oil, testing.

Alma 1 Borden.....NE SE NW 4-8-8
Gilcrease 3,150 ft., perf. 3,309-10 ft., est. 1,000,000 to 1,500,000 cu. ft. gas, fluid rose 2,500 ft., P.B. 3,110 ft., waiting on cement.
Weldon Hall 1-A Jackson (twin)....N½ NE SE 14-7-7
Cored 3,175-81 ft., recovered sand stained and odor, 5-in. 3,168 ft., rigging up standard tools.

Stephens County

Halliburton 1 fee.....SE SW SW 5-1s-7w
T.D. 960 ft., to run electric log.
Gulf 1 Krieger.....E½ NE SW 3-2-5w
Show oil 2,573-82 ft., lime 4,159 ft., sandy lime 4,178-84 ft., drilling 4,200 ft.
Carl Carter 3 Parker.....
NW cor. 180 ft. S by 510 ft. W, NE cor. 16-1s-5w
T.D. 736 ft., gas 590-603 ft., water 620-30 ft., dry sand 650-65 ft., gas 733-37 ft., 6⅝-in. 736 ft., pulling 8 and 10-in.

Woods County

Gulf 1 Hess.....NE NW 33-23n-13w
Sylvan 7,030 ft., Viola 8,040 ft., Simpson 8,055 ft., drilling in dolomite and lime at 8,292 ft.

Southwest Texas Fields

(Continued from Page 209)

Bee County

Earl Rowe et al 1 Blaschke, 3 miles SW Skidmore, Fred Wagenfuehr Sur., drilling shale 3,830 ft.

De Witt County

Atlantic 1 Zengerle, Thomaston field, coring sand 8,600 ft.

Jim Wells County

R. S. Waldron 1 L. W. Roth, SW of Orange Grove townsite, Blks. 83 and 84, Zander Farm lots, drilling shale 1,535 ft.

Kleberg County

Skelly 1-388 State, Baffin Bay field, drilling shale 8,035 ft.

Lee County

Humble 1 Melde, NW of Giddings, L. P. Rucker Sur., T.D. 6,222 ft., fishing.

Nueces County

Stanolind 1 Katherine Shaffer, 1 mi. west of Luby field, coring shale 4,300 ft.

San Patricio County

L. A. Douglas 1 Henry, Blk. 36, E. Nelson Sur., drilling shale 5,920 ft.

Willacy County

Pan American 1 G. C. Kent, northwest discovery well, Willamar field, drilling shale 5,665 ft.
Pan American 1-B Willamar Community, 1,000 ft. southeast of discovery well, Willamar field, drilling shale 8,560 ft.

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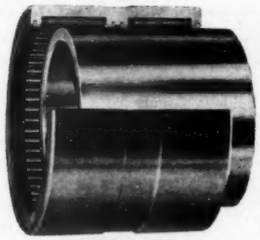

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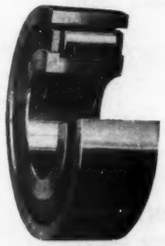

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AMERICAN
Heavy-Duty ROLLER BEARINGS

La Barge and Cut Bank Get Wells; Rock River Test Dry

By

T. R. INGRAM

DENVER, Colo., Jan. 27.—Completions in the Rocky Mountain area were down to four wells, of which two were oil wells and two were dry holes, equally divided between Wyoming and Montana. Most of the wildcats, particularly in the mountain districts, are shut down, some temporarily, on account of the cold weather, and others until spring. Road conditions at remote locations generally become bad early in December and seldom become passable before April or May.

Ohio 2 Lundy, an outpost in the Rock River field, Carbon County, Wyoming, was dry and abandoned after testing the Dakota and Lakota. Texas 1-J in La Barge district, was a flowing well, making 135 bbl. in 16 hours through a bean.

In Montana, Cut Bank had a good completion in doubtful territory in Santa Rita Oil & Gas 1 fee, which swabbed 270 bbl. in 24 hours. Kevin-Sunburst had one dry hole in Hannah-Porter 1 Donovan.

Two wells were started in the Fulcer Basin district, San Juan County, New Mexico, near the discovery drilled in as a gasser last year.

COLORADO

Boulder County

Bartson Oil 1 Chenburg ..... SW SW SE 15-2n-70w
Cemented 12½-in. at 65 ft.
J. A. Warren 3 Maxwell ..... NW NE NW 24-1n-71w
Drilling 1,081 ft. in hard sandy shale, show of oil on slush pit.

Huerfano County

I. E. Sideman-White 1-X Martinez SW NE 33-26s-67w
Drilling 1,650 ft.

La Plata County

Nick Spatter 1-X Bryce ..... SW SW 31-33n-9w
T.D. 4,400 ft., cementing caves.

Larimer County

E. P. Gallup 1 Hanson ..... C SE NW 36-10n-71w
Depth not reported, considerable water trouble.

Logan County

West Plains 1 Sheldon ..... SE NW SW 3-10n-55w
Drilling 3,400 ft. in shale.

Moffat County

Mountain Fuel Supply 2-A Musser ..... CWL NW SE 4-11n-97w
Drilling 2,002 ft. in upper Wasatch.

Park County

South Park Oil 1 Lamar .... NE NE SE 34-11s-75w
Drilling 7,705 ft.

Rio Blanco County

Texas-California 5 Unit ..... NW NE NE 34-3n-94w
Coring 6,018 ft.

Routt County

Mid-Colorado Pet. 1 Omholt ..... NE NE SE 29-4n-87w
T.D. 3,160 ft., 2,600 ft. water in hole, cementing 6⅝-in.

SUMMARY OF COMPLETIONS

Wyoming

	No.	Bbl.	Footage
Oil wells	1	135	1,090
Dry holes	1	.....	4,210
Total	2	.....	5,300

Montana

Oil wells	1	270	2,925
Dry holes	1	.....	1,163
Total	2	.....	4,088

WYOMING

Big Horn County

McDonald & Curtis 1 Orchard .... SE NW 24-51n-93w
Drilling 1,465 ft., deep test. Torchlight field.

Carbon County

Ohio 2 Lundy, SE NE NW 34-20n-78w, an outpost in the Dakota sand on the northwest of the Rock River field, was plugged and abandoned at 4,210 ft., total depth, after finding water in the Lakota at 4,189-4,210 ft. Top of the Dakota was at 4,127 ft. It is nearly ½ mile west of 4 State, completed in 1936 for 1,223 bbl. initial, in the Sundance sand.

Sinclair-Wyoming 19 Wertz ..... SE SW SW 6-26n-89w
Moving in rotary.

Sinclair-Wyoming 20 Wertz ..... NE SW NE 7-26n-89w
Cellar.
Sinclair-Wyoming 2-A Mahoney C SW NE 34-26n-88w
T.D. 4,520 ft., shot with 695 qt., cleaning out.
Sinclair-Wyoming 16-A Wertz .... SW SW SW 6-26n-89w
T.D. 6,227 ft., swabbing down to test.

Crook County

Vickers-Continental 1 Duncan-Loban ..... NE NW SW 28-57n-64w
Drilling 2,403 ft. in lime.

Natrona County

Royal Oil Corp. 1 Midert ..... SW SW SW 26-35n-80w
Drilling 1,509 ft. in Steele shale.
Casper Creek Oil Co. 1 State SW SW SW 36-36n-81w
Drilling 2,100 ft., show gas at 2,010 ft.

Niobrara County

Minnelusa 4 Joss, an outpost well on the west side of Lance Creek, is drilling deeper after swabbing 28 bbl. in 14 hours at 5,338 ft. following acidization with 2,000 gal. It had the top of the Leo sand at 5,302 ft. and at 5,320 ft. had no results after acidizing. It is approximately on the same contour as three producers to the south in Section 7 and two dry holes ¾ mile to the north which failed to pick up the Leo.

Continental 6 Otto Rohiff ..... C SW SW 32-36n-65w
Drilling 4,110 ft. in red beds.
Continental 24 Tom Bell ..... NW NW NW 34-36n-65w
T.D. 3,050 ft., P.B. to 2,400 ft., redrilling at 2,546 ft.
Continental 7-A Schuricht ..... SE NW SW 5-35n-65w
Drilling 3,290 ft. in shale.
Argo Oil 15 Elliott ..... NW NE SW 5-35n-65w
Drilling 3,871 ft., cemented 11¾-in. at 313 ft., top Colorado 3,185 ft.
Ohio 18 Putnam ..... NE NW NW 4-35n-65w
Spudded.
Western Petroleum 1 Mosier ..... SW SW 31-35n-64w
Building rig.
Ohio 9 Agnes Rohiff ..... SE NE SE 32-36n-65w
T.D. 4,966 ft. in lime and anhydrite, trying to free drill pipe.
Minnelusa Oil Corp. 4 Jose .... SW NE SW 6-35n-65w
Drilling 5,475 ft.

Park County

Resolute 2 State ..... SW SW 16-57n-101w
T.D. 10,121 ft., recemented whipstock at 7,408 ft., redrilled to 7,954 ft. and S.D.

Platte County

Dividend O. & R. 1 Johnson .... NW SW 17-24n-66w
S.D. 3,814 ft. for casing.

Sublette County

Texas Co. had another good completion in the north extension of the La Barge field in its 1-J Government, NW SW SW 27-27n-113w, at 1,090 ft., total depth, which flowed 135 bbl. in 16 hours through a $\frac{4}{64}$-in. bean on the tubing from the second sand in the Wasatch.

Klumpe Syndicate 1 ..... NE SW NE 28-27n-113w
Drilling 1,700 ft., show of gas at 1,512 ft.
Texas 1-C Government ..... SW NW NW 24-27n-113w
Rigging cable tools.
Marvel Oil 6 Government .... CEL SE SE 28-27n-113w
Rigging up.
North La Barge Oil 6 Govt. CNL SE NE 28-27n-113w
T.D. 1,120 ft., prepare to test.

Sweetwater County

Sinclair-Wyoming 95-A ..... SW NW NW 11-26n-90w
Drilling 824 ft.
Rocky Mountain Drlg. 1 State SW SW SW 36-20n-104w
S.D. 3,974 ft. for orders, no oil or gas.

Uinta County

Meridian Oil 2 Pat. ..... NW NW NE 26-13n-119w
T.D. 1,015 ft., trying to shut off water with 6¼-in. and testing show oil at 1,012 ft.

Weston County

Lanam-Crowley Oil Co. 1 ..... SW SW NW 8-46n-63w
Drilling 615 ft. in shale, 6⅝-in. at 610 ft.

MONTANA

Big Horn County

Big Horn Oil & Gas 44 ..... NW SE NE 16-1s-33e
Drilling 640 ft. Hardin district.

Blaine County

Montana Gas 2 Bjornsen ..... SE NE NW 34-32n-19e
Cemented 8¼-in. at 765 ft.

Cascade County

Bushford Pet. Synd. 1 Shannon-Roberts ..... C SW NE 12-20n-1e
Drilling 3,190 ft. Vaughn district.

Daniels County

Copan O. & G. 2 Wiley ..... NW NW NW 10-36n-50e
T.D. 1,928 ft., ready to resume drilling with rotary.

Glacier County

Cut Bank had only one completion and one new operation. The completion was Santa Rita Oil & Gas 1 fee, C SE SE 25-34n-6w, in a district which was considered very doubtful since only one 60-bbl. well has been completed in the section and several dry holes were drilled to the east. It proved to be a surprise and swabbed 270 bbl. first 24 hours at 2,925 ft., total depth, from the Cut Bank sand at 2,885-2,917 ft. The main pay was at 2,905-17 ft. and oil rose 1,700 ft. in the hole. The company owns the land in fee.

Santa Rita 2 Jacobson ..... C NW NW 17-33n-5w
Spudded, first report.
R. C. Tarrant 4 Wiley-Jones .... SE NW SW 31-34n-5w
Cemented 8⅝-in. at 485 ft., top Colorado 465 ft.
Santa Rita O. & G. 5 Govt. ..... SE NE NE 7-32n-5w
Cemented 10¾-in. at 634 ft., top Colorado 585 ft.
Ed Reagan 1 Tribal-194 ..... CEL SE NE 22-37n-7w
Cemented 10¾-in. at 316 ft., building rotary rig.
Texas 1 Lander ..... C SE NE 20-35n-6w
Drilling 1,025 ft., top Colorado 790 ft.
Texas 2 Aronson ..... C NW SW 21-35n-6w
Drilling 2,956 ft.
Frank Henderson 1 Tribal-190 NW NW NW 29-32n-5w
Spudded.

Fergus County

Hess & Tony 1 State ..... CWL SW NE 36-22n-17e
Cemented 7-in. at 414 ft.

Phillips County

Montana-Dakota 623 ..... C NW NE 34-32n-33e
Cemented 5½-in. at 701 ft.

Toole County

Kevin-Sunburst had one completion and one new operation. Hannah-Porter 1 Donovan, C SW SE 8-33n-1w, which had the Sunburst at 1,153-63 ft., had no results following a shot and was plugged and abandoned.

Consumers Gas 2 Kurtuzfeld .... NE NE SW 26-34n-1w
Spudded, first report.
Frank P. Walsh 2 Mowat ..... CSL NE NE 7-33n-2e
Cemented 7-in. on bottom at 1,173 ft.
Hole Brothers 1 Potter ..... C NE NE 23-33n-4w
T.D. 1,510 ft., running 8¼-in., water in sand at 1,020-40 ft.
Big West Oil 9 Allen ..... CEL SE SW 31-35n-1w
T.D. 1,330 ft., small show gas in Sunburst sand at 1,185-1,205 ft., acidized 1,000 gal., standing, no test.
High Gravity Oil Prod. 1 Govt. SE NW NE 19-35n-3w
Drilling 1,980 ft., Sunburst at 1,880-1,960 ft.
Kevin Oil 4 Leach ..... C SE NE 31-35n-3w
T.D. 1,669 ft., cemented 7-in.
Pfabe & Engleking 13 Govt. .. CNL SE SE 19-35n-2w
T.D. 1,518 ft., acidized 500 gal., no results, will shoot and acidize again.
Montana Gas 1-X Nelson ..... CNL SE NE 12-35n-1e
T.D. 2,135 ft., reaming to set larger pipe.

NORTHWEST NEW MEXICO

Bernalillo County

David H. Boyd 1 Wright 11-10n-5e
Spudded to 55 ft. and S.D.

San Miguel County

Southwest Drilling, Inc., 1 Conchas NW NE 34-17n-21e
T.D. 2,735 ft., recemented 8¼-in. at 2,635 ft.

San Juan County

Two new operations in the Fulcher Basin district are getting under way. The Carroll interests are starting 2 Government ¼ mile northeast of 1 Government, the discovery, which was completed in September 1940, at 1,989 ft., for 1,200,000 cu. ft. of gas a day, and the Southern Union Production Co. ¾ mile to the south of these wells for 1 Cornell-Government. The last named will go to the Picture Cliff sand at around 2,000 ft. The district is 4 to 5 miles northwest of the Kutz Canon Gas field.

Carroll & Carroll 2 Govt. ..... C NW NW 12-29n-12w
Drilling 550 ft., first report.
Southern Union Prod. 1 Cornell-Government ..... C SE SW 12-29n-12w
Spudded, first report.
Red Cactus Oil 1 Tribal ..... SE SE SE 35-29n-18w
Set 6⅝-in. at around 800 ft.

Torrance County

Cardinal Oil Co. 1 State ..... SE SW 3-8n-14e
Spudded.
Orville J. Lee 1 Milburn ..... C NW SW 36-7n-7e
Rigging up.
J. P. Stewart 1 Laman ..... C NW NE 3-3n-12e
T.D. 776 ft. in gray lime, fishing.

UTAH

Box Elder County

Northern Oil 1 ..... NE SW 17-13n-4w
Resumed at 386 ft. and drilling ahead at 475 ft.

Summit County

Longwell Pet. Co. 1 ..... SE SW SE 35-3n-5e
Drilling 3,546 ft. in brown limy shale with show of gas, 4¾-in. at 3,528 ft.

By
STAFF CORRESPONDENT

Operators Speed to Trenton Before Discovery Is Tested

MATTOON, Ill., Jan. 27.—Developments in Illinois were quiet during the week with only five new wildcat locations reported. This is a new low for the state and continues the decline in activity which has been evident for several months. White County continues to be one of the most active in the basin area with operators still attempting further extensions of the Calvin pool. Considerable development and extension of the North New Harmony pool is also under way in this area.

Trenton Development

Paul Rossi's Trenton discovery well in the Salem field still had not been gaged at the end of the week. Although the well had been on pump for several days, a gas-lock prevented the recording of accurate production figures and rods and tubing were being pulled in an attempt to correct the pumping difficulty. It is generally believed, however, that the well will not be a large producer.

Trenton developments in the field are bunched around the discovery well and have not yet spread throughout the field, although successful completion of some of the wells now being deepened to the Trenton will probably speed up this development.

Kinmundy Test Dry

A closely watched test in Kinmundy Township, Marion County, was dry at a total depth of 2,251 ft. in the McClosky. This test, Absher and Booth 1 Hoffman, NW NW NW 31-4n-3e, found the Benoist dry at 2,007 ft. and was drilled on to the McClosky which was topped at 2,201 ft. The test was important because it is in an area that has been highly regarded by many oil men since extensive Illinois development began in 1937. Throughout the period of its drilling there was extensive royalty buying in the area with reported prices reaching as much as $150 an acre in some instances.

Other Developments

The West Liberty pool in the extreme southern part of Jasper County continues to be the location of the largest producers in the state as new completions still produce an average of over 1,000 bbl. per well initially. Jasper Oil 1 Poehler, N½ NE NW 7-5n-10e, may open up development of the Aux Vases formation in Jasper County if successfully completed as a producer in this formation. The operators are fishing and repairing after a 20-qt. shot at 2,784-90 ft. Prior to the shot the well filled with 2,000 ft. of fluid which contained about 70 per cent oil. Pay was found at 2,877-82 ft. All former production in the area near this well has been from the McClosky.

In the Hoodville pool of Hamilton County many Benoist wells that have declined to about 40 bbl. a day are being deepened to the Aux Vases sand where some flow as much as 500 bbl. a day. These wells are being deepened an average of about 75 ft.

ILLINOIS COMPLETIONS

Effingham County

Wildcat: C. L. Ervin 1 Anderson, NW NW NW 5-8n-4e, dry, elev. 553 ft., Glen Dean 1,382 ft., Benoist 1,655 ft., T.D. 1,668 ft.

Fayette County

Louden pool: Carter 2 Roy Miller, NW SW NE 1-8n-3e, pumped 36 bbl., 35-qt. shot 1,511-23 ft., Cypress sand 1,505 ft.

Magnolia 39 T. C. Clow, SE NW NE 5-7n-3e, flowed 364 bbl., 60-qt. shot Paint Creek 1,529-53 ft., 30-qt. shot Cypress 1,467-94 ft., T.D. 1,553 ft.

Hamilton County

Hoodville pool: Gulf Refining 2 Austin, NW NW NE 34-5s-6e, pumped 106 bbl., 10-qt. shot 2,972-78 ft., Benoist 2,968 ft., T.D. 2,983 ft.

Franklin County

Wildcat: E. S. Adkins 1 Orient Coal Co., NE SW SE 24-6s-2e, pumped 394 bbl., 15-qt. shot 2,120-48 ft., T.D. 3,045 ft., P.B. 2,150 ft.

Helmerich & Payne 1 P. M. Marvel, NW NW SW 36-7s-4e, dry, Kinderhook 1,857 ft., Degonia 1,999 ft., Menard 2,247 ft., Vienna 2,406 ft., Glen Dean 2,531 ft., Barlow 2,779 ft., Benoist 2,998 ft., Ste. Genevieve 3,135 ft., T.D. 3,220 ft., P.B. 2,670 ft.

Thompsonville pool: Wilhelmi & Gillian 2 Searles, SE NW NE 34-7s-4e, location abandoned.

Jackson County

Wildcat: Magnolia 1 Smith heirs, SE SE NE 9-8s-3w, dry, Trenton 3,705 ft.

Jasper County

West Liberty pool: Pure 2 Tedford Consol., W½ NE SW 20-5n-10e, flowed 1,545 bbl., 1-in. choke, 5,000 gal. acid, flowed 954 bbl., natural, McClosky 2,807-15 ft., T.D. 2,830 ft.

Pure 1 E. Herrick, W½ NE SE 32-6n-10e, flowed 781 bbl., 1-in. choke, 5,000 gal. acid, McClosky 2,782-87 ft., swabbed and flowed 162 bbl. in 6 hr., natural, T.D. 2,825 ft.

Pure 1 L. Herrick-A, E½ SW SE 32-6n-10e, flowed 459 bbl., 5,000 gal. acid, McClosky 2,750-56 ft., T.D. 2,780 ft.

Pure 1 G. W. Aklin-A, SW SE NW 17-6n-10e, dry, pumped 3 bbl., 1,000 gal. acid, McClosky 2,855-58 ft., T.D. 2,867 ft.

North Noble pool: Pure 1 W. J. Meyers, SE SE SW 13-4n-9e, pumped 14 bbl., 30-qt. shot, Cypress 2,579-94 ft.

Pure 2 C. A. Bavrer, NW NE NW 25-4n-9e, pumped 45 bbl. oil and 21 bbl. water, 30-qt. shot, Cypress 2,575-92 ft., T.D. 2,592 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: East Calvin	10	1,185	27,564
Louden	2	400	3,058
Maud	2	370	5,348
North New Harmony	4	1,062	11,333
North Noble	2	59	5,186
West Liberty	3	2,785	8,435
Other pools	7	2,884	17,963
Wildcats	1	394	3,045
Dry holes: Fields*	3	.....	6,826
Wildcats	10	.....	21,837
Total	44	.....	107,550
Recompletions	1	115	.....

*West Liberty 1, Dupo 1, North Aden 1.

Lawrence County

Wildcat: Perry 1 R. N. Brown, NE SW SE 22-3n-13w, dry, Glen Dean 1,490 ft., McClosky 2,451-60 ft., T.D. 2,503 ft.

Madison County

Wildcat: Harr & Siegler 1 Bellin, NW NW SE 17-4n-5w, dry, T.D. 635 ft.

Montgomery County

Wildcat: Ginsberg et al 1 McDenver, SW NE SE 14-7n-2w, dry, Golconda 955 ft., Cypress 1,030 ft., Benoist 1,142 ft., T.D. 1,245 ft.

Pope County

Wildcat: L. V. Garnier 1 Peoples, NE NE NE 30-11s-5e, dry, T.D. 2,204 ft.

St. Clair County

Dupo pool: J. Osborne 2 Reibling, SE SW NE 33-1n-10w, dry, Trenton 503 ft., T.D. 516 ft.

Wabash County

Maud pool: Bell Bros. 1 Keep, SE NW NE 34-1s-13w, pumped 10 bbl., 1,000 gal. acid, McClosky 2,606-09 ft., T.D. 2,714 ft., P.B. 2,614 ft.

Continental 2 Seiler, NE SW NE 34-1s-13w, pumped 360 bbl., 4,000 gal. acid, McClosky 2,592-2,602 ft., T.D. 2,634 ft.

Mount Carmel pool: O'Meara 2 Butter, NW SW NE 17-1s-12w, flowed 1,000 bbl. (est.), 500 gal. acid, McClosky 2,362-76 ft., T.D. 2,395 ft.

Griffin pool: Longhorn 14 Heil, SW SW SW 7-3s-13w, Pumped 17 bbl., 30-qt. shot, Pennsylvania sand 1,228-48 ft., T.D. 1,261 ft.

Washington County

Wildcat: Taylor Drlg. 1 S. S. Barnett, SW SE SW 20-3s-4w, dry, Aux Vases 1,135 ft., T.D. 1,142 ft.

Wayne County

West Enterprise pool: Pure 2 S. A. Coburn, NE NE NW 1-1n-7e, pumped and flowed 1,227 bbl. oil and 7 bbl. water, 5,000 gal. acid, Fredonia 3,010 ft., T.D. 3,066 ft.

Enterprise pool: Pure 5 J. W. Barth-A, NE NW NW 5-1n-8e, pumped 212 bbl. oil and 18 bbl. water, 5,000 gal. acid, McClosky 3,024-26 ft., 3,038-40 ft., 3,068-70 ft., T.D. 3,090 ft.

North Aden pool: Texas 1 E. Fleming, NE NE NE 32-2s-7e, dry, 4-qt. shot, Aux Vases 3,222-26 ft., St. Louis 3,438 ft., T.D. 3,443 ft., P.B. 3,382 ft.

White County

East Calvin pool: Ryan 7 Bramlett-A, SW SE SW 17-4s-14w, pumped 165 bbl in 22½ hr., 20-qt. shot, Aux Vases 2,868-84 ft., 2,816-37 ft.

Ryan 10 Bramlett-A, E½ SW SE 17-4s-14w, pumped 198 bbl., 3,000 gal. acid, McClosky 2,928-35 ft., T.D. 2,945 ft.

Ryan 11 Bramlett-A, S½ SW SE 17-4s-14w, pumped 134 bbl., 20-qt. shot 2,702-10 ft., Benoist 2,686 ft., T.D. 2,716 ft.

W. W. Gray 1-H fee, NW NE NE 20-4s-14w, pumped 175 bbl., 40-qt. shot 2,704-20 ft., Benoist 2,695 ft.

Arrow Drlg. 5 Hahn-D, NE SW SW 33-3s-14w, pumped 40 bbl. oil and 240 bbl. water, 3,000 gal. acid, McClosky 2,888-2,903 ft., T.D. 2,915 ft.

Harris & Meyers 1 A. Cox Strip, SW SE SE 5-4s-14w, pumped 25 bbl., 2,000 gal. acid, McClosky 2,914-32 ft., T.D. 2,933 ft.

Duncan 1-A Hughes, NW NE SE 17-4s-14w, pumped 87 bbl., 30-qt. shot, Cypress 2,560-90 ft.

W. W. Gray 1-A fee, SE SW NE 17-4s-14w, pumped 78 bbl., 30-qt. shot, Cypress 2,569-88 ft.

W. W. Gray 5 fee, NW SW NE 17-4s-14w, pumped 138 bbl., 30-qt. shot, Benoist 2,692 ft., pay 2,705-20 ft.

Ryan 6 Bramlett-A, SE SE SW 17-4s-14w, pumped 145 bbl., Tar Springs 2,290-2,306 ft., Cypress sand 2,594 ft., T.D. 2,615 ft., P.B. 2,605 ft.

North New Harmony pool: Tide Water 11 Dennis, NW NE NE 33-4s-14w, pumped 200 bbl., Benoist 2,686 ft., T.D. 2,733 ft.

Superior 3 Ford-D, NW NE NE 34-4s-14w, flowed 460 bbl., 5,000 gal. acid, McClosky 2,868-80 ft., 2,897-2,901 ft., T.D. 2,950 ft.

Superior 7 H. E. Given-D, SW SW SW 34-4s-14w, pumped 260 bbl., McClosky 2,894-2,902 ft., perf. Aux Vases 2,825-36 ft., T.D. 2,915 ft.

Superior 7 Greathouse, NW NW NE 4-5s-14w, pumped 142 bbl., 4 per cent b.s. and w., 80-qt. shot 2,714-35 ft., Benoist 2,693 ft.

Storms pool: Angle 2 Storms, SW NW NE 23-6s-9e, flowed 252 bbl., 15-qt. shot, Waltersburg sand 2,245-62 ft.

South Griffin pool: Patton-Carey 2 Reeves, SE NE SW 28-3s-14w, pumped 70 bbl., 2,000 gal. acid, McClosky 2,887-99 ft., Cypress 2,598-2,620 ft., T.D. 2,906 ft.

Wildcat: Superior 1 H. C. Ford-A, SW SW NW 23-4s-14w, old well drilled deeper, pumped 115 bbl., 4 per cent b.s. and w., Cypress 2,594-2,602 ft., 2,650-67 ft., T.D. 2,957 ft.

O. O. Borden 2 McCallister, SE SE NE 7-5s-14w, dry, T.D. 2,655 ft., base Pennsylvanian 1,914 ft., Clore 1,972 ft., Palestine 2,077 ft., Menard 2,130 ft., Vienna 2,285 ft., Glen Dean 2,373 ft., Barlow 2,601 ft., Cypress 2,607 ft.

Arrow 1 Eastwood, SW SE SE 29-3s-14w, dry, Menard 2,188 ft., Glen Dean 2,432 ft., Barlow 2,779 ft., Benoist 2,810 ft., T.D. 2,860 ft.

ILLINOIS DRILLING REPORT

Alexander County

E. Solomon 1 U. S. Brown ..... NE NE NE 15-15s-3w Spud.

Clark County

Sherritt et al 1 Jeffers ..... SE NE SE 31-11n-13w S.D. 1,400 ft.

Shawver & Gallatin 1 Howard .. SE SE NE 25-10n-14w Putting on pump.

De Kalb County

J. E. Milburn 1 Eraas ..... NW NW SE 22-38n-3e S.D. 2,000 ft.

Douglas County

Pogue et al 1 Owens ..... NW SW NW 26-15n-7e S.D. 850 ft.

Edwards County

H. H. Weinert 1 A. Wick ..... NW NW NW 24-2s-10e Menard 2,300 ft., Waltersburg 2,345 ft., S.D. 2,383 ft.

J. D. Baines 1 Hodgeson ..... N½ NE 1-2s-10e Whipstocking 2,330 ft.

Fayette County

Turner Drlg. 1 Williams ..... SW SW NW 6-6n-2e T.D. 200 ft., moving in standard tools.

Ford County

Nelson et al 1 Erp ..... SW NW SE 19-24n-7e Set 5-in. 2,454 ft., drilling 2,463 ft. (coring).

Franklin County

Wegener 1 Old Ben Coal Co. ..... NE SE SE 13-6s-2e Rig.

Taylor Drlg. 1 Malkey heirs ..... SE SE SE 13-6s-2e Rig.

E. S. Adkins 1-B Orient Coal ..... SE NE NW 12-7s-2e T.D. 2,809 ft.

Gallatin County

Snowden & McSweeney 1 Egyptian T. & T. ..... SE SW SE 18-8s-10e Set 10-in. 136 ft., drilling 1,760 ft.

Cameron 2 Robinson ..... SE NW NW 4-8s-8e 50-qt. shot 1,710-20 ft., pumped 40 bbl. in 8 hr., testing.

Cameron Bros. 1 J. B. Green ..... NW SE SW 4-8s-8e Kinderhook 1,385 ft., Clore 1,542 ft., Palestine 1,700 ft., set 7-in. 1,702 ft., T.D. 1,717 ft.

W. E. Allund 1 E. Frye ..... NE SE NW 19-8s-10e Clore 1,776 ft., 10-qt. shot 1,781-86 ft., S.D.

Greene County

Scroggins 1 McVay ..... SW NE 4-10n-11w Drilling 478 ft.

Jackson County

G. Hass et al 1 J. B. Bechtloff ... S½ SW NE 5-8s-2w Rig.

Barton & Shipmen 1 P. Maharry .. NE NE SE 20-9s-3w Fishing 460 ft.

W. R. White 1 Dean ..... NE NW NW 18-9s-3w
S.D. 1,250 ft.

Jasper County

L. M. Delatine 1 J. Huddleston . S½ SW NE 9-8n-10e
Base Pennsylvanian 1,845 ft., Waltersburg 1,855 ft., Vienna 1,890 ft., Cypress 2,130 ft., Benoist 2,314 ft., Aux Vases 2,382 ft., Ste. Genevieve 2,429 ft., St. Louis 2,545 ft., S.D. 2,557 ft.
Pure 1 C. C. Price ..... W½ SW SW 16-6n-10e
Glen Dean 2,287 ft., Cypress 2,440 ft., Ste. Genevieve 2,760 ft., Fredonia 2,790 ft., show oil 2,446-47 ft., pay 2,792-95 ft., 2,800-05 ft., set 5-in. 2,788 ft., T.D. 2,820 ft.
Jasper Oil 1 Poehler ..... N½ NE NW 7-5n-10e
20-qt. shot 2,784-90 ft., show oil, fishing and repairing.

Jefferson County

Whisenant & Trenchard 1 Grant . NW NW SW 29-3s-3e
Drilling 1,850 ft.

Johnson County

Benedum-Trees 1 Cavitt ..... SW SW NW 24-11s-3e
Set 10-in. 170 ft., drilling 1,125 ft.

Macoupin County

Bridges & Valbert 1 Feiker ..... NW NE SW 1-9n-7w
Ste. Genevieve 985-1,010 ft., fishing 1,120 ft.

Lawrence County

Robinson 1 Sauers ..... NW SE NW 20-3n-12w
Alexandrian 4,515 ft., Maquoketa 4,551 ft., S.D. 4,850 ft.

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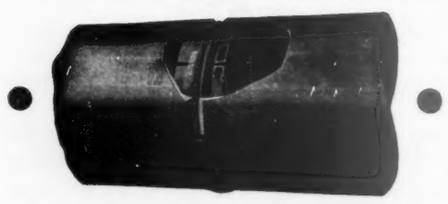

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W. Payne 1 H. Payne ..... NW SW NW 20-3n-11w
Ste. Genevieve 700 ft. and 750 ft., show oil 898 ft., drilling 915 ft.

Madison County

E. A. Gilchrist 1 E. Hasto ..... NW NW SW 5-5n-5w
S.D. 655 ft.
Alch & Carroll 1 Rinkel ..... SE NE NW 33-5n-6w
Waiting on casing 675 ft.
Wickwire 7 Camberling 1 Ellis . W½ NW SE 22-3n-6w
S.D. 705 ft.

Marion County

Paul Rossi 8 Brooks ..... SW NE SW 29-2n-2e
Saturation 4,537-4,602 ft., swabbed 218 bbl. in 20 hr., casing, pumped and flowed 68 bbl. in 14 hr., pulling tubing and rods, gas locking.
Alisher & Booth 1 Hoffman .... NW NW NW 31-4n-3e
Menard 1,468 ft., Glen Dean 1,683 ft., Cypress 1,870 ft., Benoist 2,007 ft., Aux Vases 2,069 ft., Ste. Genevieve 2,140 ft., Fredonia 2,184 ft., drilling 2,230 ft.

McLean County

Funks Grove O. & G. 1 Crawford ..... NW NW NW 28-22n-1e
Drilling 1,650 ft.

Montgomery County

H. C. Detrick 1 W. H. Barnes .. NW NE SE 20-10n-2w
Drilling 1,107 ft.
F. Brown 1 Luddeke ..... SE NW NW 28-9n-4w
Mississippi lime 855 ft., slight show oil 606-08 ft., S.D. 1,025 ft.
Keith 1 Varner ..... NE SE SW 3-8n-5w
Setting casing.
J. Warner 1 R. De Fratus ..... SW SW SW 18-10n-4w
Pottsville sand 590 ft., 20-qt. shot 590-602 ft., 400 ft. oil in hole, cleaning out, T.D. 602 ft.

Randolph County

J. R. Rankin 1 B. Bierman ..... SW SW SE 3-7s-5w
S.D. 550 ft.

Richland County

M. O'Meara 1 C. Leaner ..... SW NW NE 24-4n-9e
Set 5½-in. 2,559 ft., T.D. 2,561 ft.
Oilwell Drlg. 1 F. Hilborn ..... NW SW NE 24-4n-9e
Glen Dean 2,370 ft., Cypress sand 2,582 ft., set 5½-in. 2,580 ft., T.D. 2,586 ft.

Saline County

Potter 1 Thaxton ..... E½ NW SW 28-8s-7e
Paint Creek 2,625 ft., Benoist 2,751 ft., T.D. 2,955 ft., to run casing.

Shelby County

J. Moore et al 1 fee ..... SW SW NE 30-10n-3e
Set 8-in. 1,548 ft., 6-in. 1,582 ft.
Guild et al 1 Hunter ..... NE SE NE 7-10n-3e
Elev. 635 ft., Glen Dean 1,455 ft., Benoist 1,722 ft., drilling 1,733 ft.

Tazewell County

Bartelmay 1 Mathis ..... SW NW SW 24-25n-3w
S.D. 665 ft.

Wabash County

Harris & Meyers 1 E. L. Denman SW SW SE 17-1s-12w
Menard 1,602 ft., Tar Springs 1,727 ft., Glen Dean 1,802 ft., Cypress 2,015 ft., T.D. 2,410 ft., waiting on casing.
Hays & Yingling 1 Fischer ... SW NW NW 18-1s-13w
Vienna 2,136 ft., Glen Dean 2,242 ft., Golconda 2,373 ft., drilling 2,600 ft.
Exchange 1 M. A. Strasser ..... SE SW SW 3-2s-13w
Set 7-in. 2,400 ft., T.D. 2,418 ft., 320 ft., salt water in hole, to squeeze.

Wayne County

C. R. Craft 1 J. F. Fischer ..... SE NW NW 34-1s-7e
S.D. 3,160 ft.
Poorman & Nation 1 Lloyd .... NW NE NW 19-2s-8e
Drilling 2,950 ft.

White County

Brehm & Darlen 1 Creek ..... S½ NW NW 29-6s-10e
Location.
Horton & Wiggins 1 J. G. Bradley SE SE NW 32-6s-10e
Location.
A. C. Burgen 1 Mary Kramer.....SE SW NE 36-3s-8e
S.D. 3,075 ft.
O'Meara Bros. 1 O. L. Hon ..... NW NE NE 30-4s-14w
Base Pennsylvanian 2,240 ft. (Clore), Menard 2,315 ft., Waltersburg 2,390 ft., Vienna 2,444 ft., Glen Dean 2,534 ft., Golconda 2,646 ft., Barlow 2,766 ft., Cypress 2,771 ft., Benoist 2,884 ft., Ste. Genevieve 3,089 ft., drilling 3,145 ft.
J. G. Buell 1 E. Winters ..... NW NW SW 18-4s-10e
Vienna 2,520 ft., Glen Dean 2,595 ft., Golconda 2,717 ft., Barlow 2,868 ft., Cypress 2,872 ft., Benoist 3,018 ft. (show oil), Ste. Genevieve 3,133 ft., drilling 3,200 ft.
C. A. Evarts 1 E. Brown ..... SE NE NW 29-5s-14w
Menard 2,157 ft., S.D. 2,395 ft.
Bell Bros. 1 E. H. Morris ..... NW SW NW 21-5s-14w
Menard 2,242 ft., Waltersburg 2,355 ft., set 7-in. 2,348 ft.
Jungbecker 1 J. W. Hays ..... SE SE SW 16-7s-10e
Set 10-in. 95 ft., drilling 321 ft.
Mabee 1 Hungert ..... SW SW SE 10-7s-9e
Benoist 2,824 ft., Ste. Genevieve 2,863 ft., Fredonia 2,912 ft., St. Louis 3,056 ft., T.D. 3,066 ft., set 5½-in. 2,254 ft.
Eason 1 De Laff.....NE SW NW 8-7s-8e
Cypress 2,682 ft., Paint Creek 2,767 ft., S.D. 3,195 ft.

Williamson County

Scott et al 1 Throckmorton ..... NE SE NW 29-10s-2e
McClosky 1,966 ft., T.D. 2,024 ft., P.B. 1,936 ft., set 5½-in. 1,918 ft.

La.-Ark. Fields

(Continued from Page 205)

begun 1 H. L. Taylor. About 6 miles southwest of Smithland, in Marion County, A. J. Vestal has staked location for 1 Moseley. Another San Augustine County wildcat, B. F. Findley 1 Allen has spudded in the A. N. Davis Survey, and was last reported shut down at 46 ft.

Two wildcats in Marion County and one each in Sabine and San Augustine counties comprise other explorations now active in East Border Texas.

EAST TEXAS BORDER COMPLETIONS

Smithland—Marion County

A. F. Anding 3 Sid Hart, G. Coore Sur., T.D. 2,350 ft., pumped 19 bbl., 5-in. casing 2,285 ft., sand 2,307-13 ft. and 2,315-19 ft., Tokio sand.

EAST TEXAS BORDER DRILLING REPORT

Wildcat—Bowie County

A. L. Willis 1 H. L. Taylor, John McGuire Sur., first report.

Marion County

J. D. Parsons 1 T. W. Hook, Alex. Albright Sur., S.D. 5,006 ft.
P. L. Withers et al 1 T. G. Allen, Robert Potter Sur., T.D. 1,026 ft., S.D.
A. J. Vestal 1 C. Moseley, David Lane Sur., first report.

Sabine County

Sturm & Womack 1 I. H. Kieth, L. Grace Sur., drilling 2,407 ft.

San Augustine County

Roper & Todd 1 Long Bell Lumber Co., N. Hyden Sur., T.D. 100 ft., 10-in. casing 70 ft., repair pump, S.D.
B. F. Findley et al 1 G. W. Allen, A. N. Davis Sur., first report.

California Fields

(Continued from Page 203)

4,280 ft. 2½-in. tubing. Originally completed in 1934. Los Angeles County.

Montebello Field

Union 3 Howard.....2-2s-12w
Flowed 740 bbl., 36.1 gravity, 1.4 per cent cut, 1,200,000 cu. ft. gas. 64/64-in. bean. Pressures 100/300 lb. Elev. 278 ft. T.D. 7,707 ft. 8⅝-in. water string 5,407 ft. 2,362 ft. 5½-in. liner 7,703 ft. Liner perf. 7,026-7,102 ft., 7,108-28 ft., 7,150-87 ft., 7,207-37 ft., 7,243-7,300 ft., 7,365-7,473 ft. 7,662 ft. 2½-in. tubing with packer 7,000 ft. Producing from seventh and eighth zones. Los Angeles County.

Wilmington Field

Atlantic Oil 18 Harbor.....32-4s-13w
Pumped 55 bbl., 27.6 gravity, 20 per cent cut. Elev. 28 ft. T.D. 5,788 ft. 9-in. water string 2,615 ft. 3,205 ft. 5½-in. liner 5,788 ft. Perf. 5,170-5,200 ft., 5,415-60 ft., 5,536-62 ft. 42 days from spud to completion. Los Angeles County.
Bolling Oil Co. 3 Harbor.....32-4s-13w
Pumped 140 bbl., 16.7 gravity, 5 per cent cut. Elev. 18 ft. T.D. 3,702 ft. 8⅝-in. water string 3,008 ft. 730 ft. 6⅝-in. liner 3,702 ft. Perf. 3,008-3,350 ft., 3,480-3,702 ft. 3,675 ft. 2½-in. tubing, with packer 2,965 ft. Completed in Ranger zone. 16 days from spud to completion. Los Angeles County.
Hamilton Oil Co. 1 Beach.....32-4s-13w
Pumped 135 bbl., 14.6 gravity, 1.5 per cent cut. Elev. 10 ft. T.D. 3,538 ft. 8⅝-in. water string 3,184 ft. 375 ft. 6⅝-in. liner 3,534 ft. Perf. 3,184-3,534 ft. 3,526 ft. 2½-in. tubing. Completed in Ranger zone. 32 days from spud to completion. Los Angeles County.
Herley & Kelley 1 Westport.....32-4s-13w
Pumped 194 bbl., 15.6 gravity, 2.1 per cent cut. Elev. 21 ft. T.D. 3,719 ft. 8⅝-in. water string 3,046 ft. 693 ft. 5¾-in. gravel-packed liner 3,719 ft. Perf. 3,046-3,319 ft., 3,397-3,719 ft. 3,713 ft. 2½-in. tubing. Completed in Ranger zone. 29 days from spud to completion. Los Angeles County.
Signal O. & G. 6-D L.B.U.P.....3-5s-13w
Flowed 325 bbl., 29.3 gravity, 0.5 per cent cut. 264,000 cu. ft. gas. 22/64-in. bean. Pressures 175/640 lb. Elev. 26 ft. T.D. 4,210 ft. 11¾-in. water string 2,549 ft. 8⅝-in. liner. Perf. 3,081-3,620 ft., 3,658-4,200 ft. 4,139 ft. 2½-in. tubing with packer 3,635 ft. Completed in upper and lower Terminal zones. 44 days from spud to completion. Los Angeles County.

LOS ANGELES BASIN OUTPOSTS OR DEEP TESTS

Dominguez Field

Union 79 Callender 32-3s-13w
Drilling 12,200 ft. Los Angeles County.

Inglewood Field

Standard 3-1 L.A.I. 17-2s-14w
T.D. 8,950 ft. Hard Miocene sandy shale. Reaming and straightening hole. Los Angeles County.
R. R. Bush Oil Co. 1 Smith.....8-2s-14w
Drilling 7,980 ft., sandy shale showing increasing quantity of gas. Very gassy sand found on drilling break at 7,950 ft. Top Nodular shale 7,865 ft. Los Angeles County.

Long Beach Field

Union 19 L.B.C. 30-4s-12w
Drilling sand and shale 10,790 ft. Los Angeles County.

COASTAL DISTRICT

Western Gulf Oil Co. failed to secure an effective water shutoff on 1 Lechler in the Oak Canyon district and the well was recemented. It should be ready for another production test within a few days and consequently the status of this area should be determined before the close of January. The well, which is located on Halsey anticline in 31-5n-17w, cored 78 ft. of Modelo oil sand at 2,290-2,390 ft. and showed up very good on formation test before the landing of pipe. On a test at 2,290-2,390 ft. the well flowed at the rate of 14 bbl. of 22.9-gravity oil per hour and at the rate of 700,000 cu. ft. of gas. No water was present during this formation test and the water present at the test for shutoff on the 8⅝-in. water string at 2,296 ft. is believed to be coming from around the shoe of the water string. Total depth is 2,442 ft. and is plugged back to 2,415 ft. Wells in this section of the state are many times deceptive in that while they make a good showing after completion they fail to hold up or come up to expectations.

Santa Maria Valley

Edge-water encroachment is beginning to manifest itself in the southwestern end of the Santa Maria Valley field and several wells have shown cuts as high as 60 per cent. The edge water appears to be fingering in irregularly closely paralleling the withdrawal of crude oil. The water intrusion is highest in the areas of largest production to date and is very irregular in that fingers will reach in and hit certain wells and not affect offsets to the wells affected. Because of this, operators have been rather slow to appreciate what was happening until it was too late. Edge-water intrusion or encroachment is not unusual in this field and it is to be expected in the normal course of events because parts of the field have not been under curtailment and this section will obviously show edge-water encroachment first. A large part of the 15,376,617 bbl. of crude oil that has been produced by the Santa Maria Valley field to date has come from certain restricted parts of the field rather than uniformly throughout the field.

COASTAL DISTRICT COMPLETIONS

Padre Canyon Field

C. C. M. O. Co. 11-A Hobson.....15-3n-24w Pumped 68 bbl., 29.9 gravity, 55 per cent cut. Elev. 295 ft. T.D. 5,567 ft. P.B. 5,548 ft. 7-in. water string 4,780 ft. 875 ft. 4¾-in. liner 5,548 ft. Perf. 5,455-5,517 ft. 5,073 ft. 2½-in. tubing. Completed in Hobson zone. 51 days from spud to completion. Ventura County.

Ventura Avenue Field

British American Oil Co. 11 Hartman.....21-3n-23w Flowed 1,050 bbl., 30.5 gravity, 5 per cent cut. 300,000 cu. ft. gas. 25/64-in. pean. Pressures 250/1,000 lb. Elev. 178 ft. T.D. 8,719 ft. 7⅝-in. water string 8,155 ft. 587 ft. 5½-in. liner 8,705 ft. Perf. 7,850-8,050 ft., 8,367-8,704 ft., gun perf. 7,850-8,132 ft. 8,661 ft. 2½-in. tubing. Completed in 57 zone. 111 days from spud to completion. Ventura County.

West Central Texas Fields

(Continued from Page 215)

Shackelford County

Semiwildcat: Roeser-Pendleton 2-A-81 Cook, NW SE Sec. 81, E.T. Sur., dry at 1,580 ft., water.
Hamby field: Charter Oil & Gas 1 Powers, 66 bbl., pumping, 1,598-1,613 ft.

WEST CENTRAL TEXAS WILDCAT REPORT

Brown County

A. J. Stokes 1 B. S. Bayston, 210 ft. from SE line and 2,962 ft. from SW line of Prosper Mangel Sur. 604, top Marble Falls 1,487 ft., set 5¾-in. casing, drilling 1,520 ft.
Johnson-Richburg-Mannan 1 Charter, SW SW Sec. 19, B.B.B.&C. Sur., 750-ft. test, first report.

Callahan County

W. D. Austin 1 I. N. Jackson, 150 ft. from N and W lines, Sec. 2, C.&M. Sur., drilling 850 ft.
C. D. Hagerty 1 Windham, 990 ft. from N and 330 ft. from W lines, SE Sec. 154, G.H.&H. Sur., show oil 980-85 ft., S.D., but may deepen.
Reeves & Sorrell 1 Young, 1,980 ft. from N and 660 ft. from E lines, Sec. 37, B.B.B.&C. Sur., H.F.W. 1,975-2,000 ft., 6⅝-in. 2,000 ft., W.O.C.

Coleman County

A. P. Heinze 1 J. Kincaid, 467 ft. from N and W lines of E½ SW Sec. 41, B.B.B.&C. Sur., 3,800-ft. test, show gas 3,387 ft., drilling 3,472 ft.
L. J. Derrick 1 J. W. Vance, 330 ft. NW of old Texas 1 Vance, also in Sec. 101, E.R. Sur., 2,100-ft. test, location.
R. H. Murray 1 Morris, 467 ft. S and W of NE 160 ac. of J. Greenwood Sur. 304, drilling 1,440 ft.
M. R. Stuard 1 Minear, 330 ft. from N and 1,850 ft. from E lines of 360-ac. tract in E. Votaw Sur. 244, location.
Cooper Brothers 1 McClure, 1,100 ft. from S and 2,400 ft. from W lines of T. B. Frizzell Sur. 711, 2,800-ft., moving in rig.

Comanche County

Campbell 1 Stark, SW part of Asa Hoxey Sur., S.D. repair 145 ft., will set 6⅝-in.
Natural Resources 1 Armor, Sec. 105, T.&N.O. Sur., 5 mi. NE of Eden, cleaned out to old T.D., prepare resume drilling, no report.

Concho County

Floyd C. Dodson 1 Robert Wilson, Thomas Green Sur., 10 mi. SW Eden, show oil and gas 3,792-95 ft., 3,819-20 ft., at 3,828-29 ft., showed 1 balled water per hr., may drill deeper.

Eastland County

C. D. Lane 1 Mason, 900 ft. from N and 750 ft. from W lines of W¼ NE Sec. 13, D.&D.A. Sur., drilling 980 ft.
W. M. Morris 1 Carrie Bryant, 1,520 ft. from N and 200 ft. from W lines of SE Sec. 20, Blk. 1, H.&T.C. Sur., 6⅝-in. 825 ft., show gas 912-25 ft., S.D.
Hickok Oil 1 Luse & Gray, NE Sec. 486, S.P. Sur., Ordovician test, ¾ mi. SE of new McElreath field, 4,250-ft. test, drilling 1,857 ft.
A. A. Hutton 1 W. Penn, NW SE Sec. 11, Blk. 2, B.B.B. &C. Sur., 600-ft. test, first report.

Erath County

W. A. Young 1 J. B. Mills, J. Harvey Sur., 5 mi. NW of Dublin, T.D. 212 ft., cleaning out hole.

Fisher County

F. A. Stephenson 1 Maberry, SE SW Sec. 56, Blk. 1, H.T.&B. Sur., 3,400-ft. test, cored 3,285-3,302 ft., recovered sand showing oil, top Swastika 3,277 ft., 40-gravity oil, deepened to 3,315 ft., swabbed 90 bbl. daily.
General Crude Oil 12 Flanigan, center of old Royston field, Ordovician test, drilling 5,799 ft.
F. A. Stephenson 1 Humphries, NW NW Sec. 49, Blk. 1, H.T.&B. Sur., 3,350-ft. test, drilling 2,000 ft.
P. R. Long 1 W. F. Davidson, SE NW Sec. 59, Blk. 1, H.T.&B. Sur., 4,300-ft. test, first report.

Hamilton County

A. J. Caldwell 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines W. H. Crowder Sur., drilling past bit 3,002 ft.
C. J. Meyers 1 Oats, 420 ft. from S and 1,035 ft. from E lines F. Hughes Sur., 4,000-ft. test, top Mississippian lime 3,827 ft., top Ellenburger 3,839 ft., flowing water into pits, no oil, still testing.
Falls Ref. Co. (formerly Wallace & Vickers) 2 Lund, C S½ of 20 acres of N½ of SW¼ R. J. Bailey Sur. 51, T.D. 3,953 ft., prep. P.B. to shut off 9 bbl. sulfur water per hour from 3,863-3,953 ft.
Gunther & Smith 1 Thompson, 467 ft. from SE and 4,533 ft. from SW lines of Rhody Kennedy Sur., spudded and S.D.
Hensley & Watson 1 Manning, 467 ft. from W and 2,500 ft. from S lines of Agapo Gaithan Sur., rotary on location.
Bob Waters 1 Oates, 3,350 ft. from SE and 8,450 ft. from NE lines of F. Hughes Sur., S.D. 350 ft., may change operators.

Jones County

Humble 2 Sears, 467 ft. from S and W lines of Sec. 37, Blk. 18, T.&P. Sur., top saturation in Swastika 3,010 ft., saturation from 3,010-22 ft., flowed 702 bbl. in 14 hr. or rate of 1,182 B.O.P.D.
Shaheen Oil 1 Young, 11,630 ft. from N and 300 ft. from E lines S. Andrews Sur. 191, 2,500-ft. test, fishing 8¾-in. casing 1,650 ft.
Danciger O. & R. 1 H. E. Gale, NE NE Subd. 91, De Witt C.S.L. Sur., 2,500-ft. test, drilling 1,070 ft.
H. Hines & W. D. Brookover 1 A. N. Wimberly, SW SW Subd. 91, De Witt C.S.L. Sur., 2,500-ft. test, prep. spud.
Fain-McGaha Oil 1 Moore, 660 ft. from NE and 1,320 ft. from SE of S 107 acres of J. D. Maltby Sur. 252, 2,500-ft. test, spudding.

McCulloch County

W. J. Dillard 1 E. B. Garrett, 467 ft. from N and E lines of Sur. 934, Abst. 1196, 3,000-ft. test, drilling 250 ft.
A. K. McCord 1 J. E. Nelson, 150 ft. from W and 1,546 ft. from S lines, Sec. 959, E. Gruene Sur., Abst. 957, location.

Menard County

Harry Baldwin 1 Leggett, SW SW Sec. 1, B.S.&F. Sur., 5½-in. at 1,200 ft., drilling 1,234 ft.

Palo Pinto County

Wilcox Oil & Gas 1 Rogers, 467 ft. from S and E lines, Sec. 894, T.E.&L. Sur., T.D. 1,002 ft., running 8¼-in. casing.
Georgian Oil 1 Weldon, A. J. Smith Sur., Abst. 383, 8¼-in. at 1,002 ft., S.D. 1,470 ft.
E. Guyer 1 Dalton, L. B. Dalton Sur., Abst. 153, show gas 3,827-53 ft., show oil and gas 3,879-81 ft., bailing live oil, some water coming in behind 8¼-in. casing at 1,930 ft., T.D. 3,881 ft. (corrected).
Elgin & Watson 1 Watson, NE NW Sec. 10, Blk. 2, T.&P. Sur., S.D.O. 4,065 ft.
Hickok Prod. and Reynolds 1 J. R. Halsell, 467 ft. from S and W lines, Sec. 92, B.B.B.&C. Sur., Abst. 105, 5,500-ft. test, spudded and shut down.

Shackelford County

Georgian Oil Corp. 2 Blach, 1,290 ft. from SE and 540 ft. from SW lines, Sec. 301, T.E.&L. Sur., deep test, spudded and S.D.
R. T. Nail 1 Cook, 150 ft. from N and W lines of SE SW Sec. 53, E.T. Sur., S.D. 700 ft.

Runnels County

A. J. Johnson 1 Bert Fletcher, E. W. Bull Sur. 333, 5,500-ft. test, S.D. 515 ft.

Taylor County

Ce-Beth Oil 1 City of Abilene, south shore of Lake Abilene on city property, 4,000-ft. test, running 10-in. casing 2,300 ft.

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Crop of Small Gassers, Four Oil Wells Mark Routine Week

By STAFF CORRESPONDENT

NEWARK, Ohio, Jan. 27.—Operations in Ohio fields held to the normal pace during the week with 23 completions, 12 gas, 4 oil wells, and 7 dry. Out of the crop of gas wells only one yielded an open flow of better than a million cubic feet. A 130-bbl. and a 75-bbl. oil well were completed in Perry County.

Deep tests.—The East Ohio Gas Co. in Chardon Township, Geauga County, is drilling in the Trenton below 5,660 ft.; top of Trenton was had at 5,260 ft. Magnolia Petroleum Co., in Smith Township, Mahoning County, and Ohio Oil Co. in Wooster Township, Wayne County, are drilling in the shallow formations. In Licking County, McCloy, Inc., struck water and shut down at 4,360 ft. in 1 N. A. Rowe, Section 21, Jersey Township.

SUMMARY OF COMPLETIONS

Ohio

	No.	Bbl.	Footage
Oil wells	4	212	7,402
Gas wells	12	*5.4	25,415
Dry holes	7	.....	16,038
Total	23	.....	48,855
Input wells	4	.....	1,698

Indiana

Oil wells	3	500	7,569
Dry holes	4	.....	7,445
Total	7	.....	15,014
Salt-water disposal well	1	.....	1,713
Gas wells	1	.....	.....

Western Kentucky

Oil wells	2	115	2,509
Dry holes	2	.....	3,245
Total	4	.....	5,754

Eastern Kentucky

Gas well	1	*0.2	2,673
Dry hole	1	.....	1,330
Total	2	.....	4,003

*Million cu. ft.

In Belmont County the test of Natural Gas Co. of West Virginia on the E. A. Mobley farm, Section 19, Smith Township, topped the Clinton sand at 7,744 ft. and shut down 14 ft. in that formation to change cable. The formation was void at that depth.

In Columbiana County this company completed a test on the William Tice farm, Section 19, Wayne Township, in the Oriskany sand with the sand topped at 4,426 ft. and a total depth of 4,436 ft. It will make a small well.

Athens County

Carthage Township: Ohio Fuel 3 D. T. Burns, Fraction 4, dry, Berea, T.D. 1,724 ft.

Fairfield County

Pleasant Township: City Natural 1 M. Hendrickson, Sec. 28, dry, no Clinton, T.D. 2,244 ft.

Holmes County

Monroe Township: Ohio Fuel 1 Enos Miller, Lot 24, second quarter, dry, Clinton, T.D. 3,399 ft.

Lawrence County

Union Township: Star Gas Co. 1 C. F. Leffingwell, Sec. 5, 120,000 cu. ft. gas, Ohio shales, shot, T.D. 2,717 ft.

Newark Field—Licking County

Newark Township: Everett Co. 1 J. R. Fitzgibbon, SW first quarter, 830,000 cu. ft. gas, Clinton, T.D. 2,393 ft.

Newton Township: A. Wiley et al 1 H. W. Gleckler, Lot 1, fourth quarter, 590,000 cu. ft. gas, Clinton, T.D. 2,640 ft.

C. A. Davis et al 1 Lawrence Bolen, Lot 1, fourth quarter, 1,760,000 cu. ft. gas, Clinton, T.D. 2,605 ft.

Lorain County

La Grange Township: D. Shaffer 2 Antone Getridge, Lot 2, 390,000 cu. ft. gas, Clinton, T.D. 2,294 ft.

Meigs County

Rutland Township: Downie et al 1 Cora Morris, Sec. 32, 90,000 cu. ft. gas, Macksburg 800-ft. sand, T.D. 754 ft.

Bedford Township: Ohio Fuel 1 William Story, Sec. 18, 60,000 cu. ft. gas, second Berea, T.D. 1,610 ft.

Medina County

Chatham Township: Marine Trust 21-A Daniel Rose et al, Tract 13, Lot 4, 5 bbl., Berea grit, T.D. 432 ft.

Marine Trust 26-O Daniel Ross, input well, Berea, T.D. 426 ft.

Marine Trust 31-O Daniel Ross, input well, Berea, T.D. 414 ft.

Marine Trust 36-O Daniel Ross, input well, Berea, T.D. 428 ft.

Marine Trust 37-O Daniel Ross, input well, Berea, T.D. 430 ft.

Granger Township: Ohio Fuel 1 J. S. Hatch, Lot 30, dry, Clinton, T.D. 3,526 ft.

Harrisville Township: Edson & Son 2 Bertha Anderson, Lot 3, dry, Clinton missing, T.D. 2,730 ft.

Morgan County

Marion Township: W. S. Harris 1 C. P. Bowman, Lot 7, 640,000 cu. ft. gas, Salt sand, T.D. 939 ft.

Noble County

Beaver Township: Barnesville Dev. Co. 1 Odessa Long, Sec. 15, 25,000 cu. ft. gas, Berea, shot, T.D. 1,424 ft.

Jackson Township: Skinner Co. 1 Joseph L. Hale, Sec. 9, dry, Keener, T.D. 1,131 ft.

Marion Township: Marion Oil & Gas Co. 1 Homer Powlton, Sec. 11, 280,000 cu. ft. gas, Berea shot, T.D. 1,721 ft.

Seneca Township: Chaseville Oil & Gas Co. 2 G. W. Craft, Sec. 30, 75,000 cu. ft. gas, T.D. 1,555 ft.

Perry County

Clayton Township: B. G. Davis et al 5 Mrs. C. A. Beacham, NW Sec. 16, 130 bbl. and 100,000 cu. ft. gas, Clinton sand, T.D. 3,260 ft.

Dittoe et al 5 C. A. Beacham, Sec. 17, 75 bbl., Clinton, shot, T.D. 3,380 ft.

Tuscarawas County

Lawrence Township: Natural Gas Co. of W. Va. 1 Louisa Bimeler, Lot 23, 500,000 cu. ft. gas, Clinton, shot, T.D. 4,763 ft.

Washington County

Aurelius Township: Turner et al 2 A. J. Longfellow, Sec. 7, 2 bbl., Macksburg 300-ft. sand, shot, T.D. 330 ft.

Wickens et al 35 fee, Sec. 19, dry, Injun, T.D 1,284 ft.

EVANSVILLE, Ind., Jan. 27.—Developments in Posey County, Indiana, during the past week indicate a new oil play may be opened up in the extreme southwestern part of the state. Carter 1 Highman, a wildcat in SW SE SW 31-5s-13w, was drilling below 2,300 ft. at the end of the week and was reported as looking good. There has been no drilling within 5 miles of this well, except a core test drilled by the Carter Oil Co. in NE SW SW 36-5s-14w. Although all information on this core test has been kept a secret of the Carter Oil Co., it is believed that the well was drilled to the top of the Ste. Genevieve at approximately 2,800 ft. Further indications of an oil play in this area were a wildcat test being started by Carter in 8-5s-13w, and a location staked in 6-5s-13w by Lewis & Lynch. These last two wells are just south and east of the town of New Harmony.

About ¾ mile due south of the discovery well of the New Golden pool of eastern White County, Illinois, Appell & Jones have staked location for a test on McFadden Island. This island, a sand island in the Wabash River, is located in 32-5s-14w.

The developments of these Posey County tests are of particular interest to many oil men because large blocks are still available in the southwest counties of Indiana should a play be opened up in this area.

INDIANA COMPLETIONS

Knox County

Midwest et al 2 Frey ..... SE SW NW 13-2n-11w
Dry, Glen Dean 1,448 ft., Barlow 1,618 ft., Bethel 1,748 ft., Fredonia 1,848 ft., show oil 1,981 ft., T.D. 1,950 ft.

Gibson County

Hall Edwards 21-A Maier ..... SE SW NE 14-3s-14w
Flowed 500 bbl., natural, pay 2,483-93 ft. and 2,498-25 ft., T.D. 2,527 ft.

Papoose 16 Cooper-A ..... NE NW SW 13-3s-14w
Pumped 150 bbl., 30-gt. shot 2,477-87 ft., T.D. 2,490 ft.

Continental 26 Bozeman ..... NW SW NW 24-3s-14w
Pumped 120 bbl., natural, pay 2,483-88 ft., 2,512-30 ft., T.D. 2,552 ft.

Continental 3 Mumford-A ..... SW SE SE 24-3s-14w
Dry, water 2,942-49 ft. and 2,890-93 ft., T.D. 2,984 ft.

Posey County

Superior 29 N. H. Realty ..... NE NW SE 9-5s-14w
Salt-water-disposal well, ripped casing 1,586-1,648 ft. and 1,681-1,713 ft., T.D. 1,713 ft.

Gulf 5 A. P. and E. Meier ..... SW SW NE 7-6s-12w
60,000 cu. ft. gas in 14 hr.

Spencer County

Troy Refining 6 Anderson ..... NW SW NE 11-6s-4w
Dry, Glen Dean 514 ft., Golconda 588 ft., Barlow 737 ft., Bethel 780 ft., T.D. 821 ft.

Vigo County

H. N. Oakley 1 Seibold ..... NW NW SW 18-3n-8w
Dry, H.F.W. 1,700 ft., T.D. 1,726 ft.

INDIANA DRILLING REPORT

Crawford County

J. C. Barnett 1 Baylor ..... SE SE SW 22-1s-2e
Salem 345 ft., Borden 400 ft., Kinderhook 480 ft., S.D. 1,000 ft.

Elkhart County

A. W. Downs 1 Harmon ..... NE NE SE 11-38n-4e
S.D. 264 ft.

Gibson County

Hyslop et al 1 fee ..... NW NE NW 20-1s-9w
Glen Dean 1,222 ft., Golconda 1,314 ft., drilling 1,332 ft.

Greene County

L. B. Jackson et al 1 Holmes ..... NW NW NW 22-7n-6w
T.D. 1,765 ft., P.B. 1,727 ft., S.D.

Knox County

James Bohannon 1 Anna Carrie SW SW SW 19-2n-10w
Pits.

Martin County

Collier & Burton 1 Swayze ..... NW NE NE 10-3n-4w
S.D. 643 ft.

Orange County

United States Oil 1 G. E. Willyard ..... NW NE SW 33-1n-1w
Spud.

Pike County

Norris 1 Doabes ..... SE NE SW 19-1n-6w
Rig.

G. W. Miller 1 Nixon ..... SE SW NE 14-3s-8w
Reaming hole 4,600 ft.

Porter County

F. Jablonski 1 Pluta ..... SW NW SW 27-37n-5w
Set 10-in. 155 ft., 8-in. 217 ft., Devonian 217 ft., show oil 217-19 ft., S.D. 219 ft.

Posey County

Jones & Appell 1 McFadden Island ..... NE NE SE SW 32-5s-14w
Location.

Basin Drlg. 1 Oakland City College ..... NE NE SW 16-8s-14w
Barlow 2,308 ft., show oil 2,350-63 ft., Renault 2,492 ft., set 7-in. 2,492 ft., rigging up standard tools.

McCummings et al 1 Oakland City College ..... NW NW SE 16-8s-14w
Set 10-in. 150 ft., drilling 450 ft.

Carter 1 Highman ..... SW SE SW 31-5s-13w
West Franklin 254 ft., Providence 485 ft., No. 6 Coal 525 ft., drilling 630 ft.

Ed Holman 1 Oeth ..... NE SE NE 6-4s-13w
S.D. 2,981 ft.

Pulaski County

Ray McClure 1 Kocker ..... NW NW SW 23-30n-3w
Devonian 114 ft., set 8-in. 265 ft., drilling 360 ft.

Spencer County

H. M. Hunt et al 1 Spain ..... E½ SE SW 32-7s-6w
Spud.

Doris McPherson 1 Nichols ..... SW NW NW 10-8s-6w
T.D. 1,075 ft., underreaming 6-in.

J. C. Ellis et al 1 Spence ..... SW NW SE 29-7s-6w
Drilling 1,260 ft.

C. E. Dice 1 Larch ..... SW NW SW NW 12-6s-4w
Drilling 650 ft.

Sullivan County

E. M. Self 1 James Land ..... NE NE NE 36-7n-9w
Rig.

W. J. Reynolds 1 Poe ..... NE NE SW 3-8n-10w
S.D. 1,450 ft.

Vigo County

Sage & Farley 1 Campbell ..... S½ NE NW 24-11n-8w
Ste. Genevieve 630 ft., drilling 850 ft., in H.F.W.

EASTERN KENTUCKY

ASHLAND, Ky., Jan. 27.—The importance of one operation, definitely termed a deep test, has been proven by reports from reliable sources in Paintsville, seat of Johnson County. These sources report a renewal of drilling in No. 44 on the L. C. Bailey tract on state Road Fork in Magoffin County. The test, not far from the Johnson County line, is down 3,548 ft. with Cumberland Petroleum drilling. The well is not far from the discovery well in the Oil Springs pool and the operation had been shut down.

The Paintsville sources say contributions from Petroleum Exploration, Stanolind Oil & Gas Co., Ashland Oil & Refining Co., and other operators are playing a part in the operation with the drill now working in lime and reported headed to the 4,000-ft. mark. Talk of St. Peter sand in connection with this well has kept it in the spotlight and operators in this section are interested in samples of the deep sand. One source here expressed the opinion the "pay sand" would be found below the 4,000-ft. level.

Floyd Fitch's reported deep test in Morgan County is said to have produced a good gas well on the Ezcar

Combs tract on Little Caney Creek. Completion data were not available here but production is coming from the bottom of Corniferous. The well was drilled in last week.

Another Morgan County operation has been reported completed with Oliver Jenkins et al shutting down after going a few feet into Corniferous in the well on the Anthony Isom farm on Pasture Creek. A flow of 75,000 to 100,000 cu. ft. of gas per day was reported but complete data were not available.

Amp Burat 1 Nelson Carrol on Devil's Creek in the Hell Creek district of Lee County was dry at 1,330 ft.

Inland Gas Corp. 27 Winfield Castle on Bushy Fork of Licking in Magoffin County had 169,000 cu. ft. of gas in shale at 2,673 ft.

Globe Oil & Gas Co. deep test on the Nat B. Sewell et al tract, southwest of London, Ky., on the Sinking Creek dome, in Laurel County, has passed the 900-ft. mark and is to be a deep test with the St. Peter sand as the objective.

The same company's Corniferous test in Clay County, southwest of Manchester, on the Martin's Creek terrace, passed through the Corniferous at 2,060 ft., with only two small shows of gas and are drilling at 2,360 ft. The company expects to get the Brassfield at about 2,400 ft.

The St. Peter test now being drilled by Mr. Wilson, of St. Louis, on the Coundiff heirs farm, 3 miles northeast of Somerset, has passed the 2,000-ft. mark with several nice shows of gas.

WESTERN KENTUCKY

Daviess County

Utica district: O. D. Vickers et al 4 W. Johnson, east tract, 100 bbl., 60-qt. shot, Barlow sand 1,388-1,406 ft., 50-qt. shot, Bethel sand 1,446-60 ft.
United Petroleum 1 R. Y. Cravens, moving in.

Henderson County

Bluff City district: C. Lautenslager et al 1 George Waite, dry, T.D. 2,150 ft.

Ohio County

Buford district: Rex-Pyramid 3 A. Jolly, 15 bbl., 40-qt. shot, Jackson sand 1,033-44 ft.
Sohio and Rex-Pyramid 3 J. T. Taylor, dry, T.D. 1,095 ft.
Rex-Pyramid 4 Albert Jolly, drilling at 700 ft.
Pattyville district: J. S. May et al 11 A. R. Renfrow, spudding in.
G. A. Morris 1 Shreeve heirs, dry, T.D. 275 ft.

Webster County

Sebree district: Sebree Oil & Gas Co. 7 J. R. Ramsey, abandoned location.

Acidizing Increases Monroe Output

An acidizing program now nearing completion in the Monroe field of Union, Morehouse, and Ouachita parishes, North Louisiana, has resulted in a substantial increase in gas-well production. The field, one of the largest gas reserves yet discovered, was declining rapidly in production. Approximately 500 wells in the field have been treated with acid with an average potential increase of 300 per cent.

The rock pressure at Monroe has declined to about 900 lb. per sq. in and the field's role as a major source of natural gas is rapidly fading. Drilling continues, however, as producers carry on more intensive development in order to maintain their production as much as possible. The acidizing program has done much to increase the gas production, but subsequent withdrawals will probably show an accelerated pressure decline. Pressures have dropped to a point now where several gas pipe-line companies have had to install additional compression equipment to maintain line pressures on their trunk-line systems.

Texas Co. Moves Division Offices to New Orleans

SHREVEPORT, La., Jan. 28.—Ellective February 1, the Texas Co. moves its division office from Shreveport to New Orleans, La. The change, contemplated for several years, was made necessary by the preponderance of company activity in coastal Louisiana.

About 100 families will be affected by the change, among them the division executives: R. C. Stewart division manager; L. G. Hughes, assistant division manager; E. L. Hawkins, assistant to the division manager; Charles H. Blish, chief attorney for Louisiana; G. T. Alexander, head of the land department; G. W. Schneider, division geologist; T. B. Simpson, division engineer; J. H. Rambin, Jr., division petroleum engineer and G. T. Briggs, chief clerk. The new division offices will be housed on the fifteenth floor of the Canal Bank Building, New Orleans.

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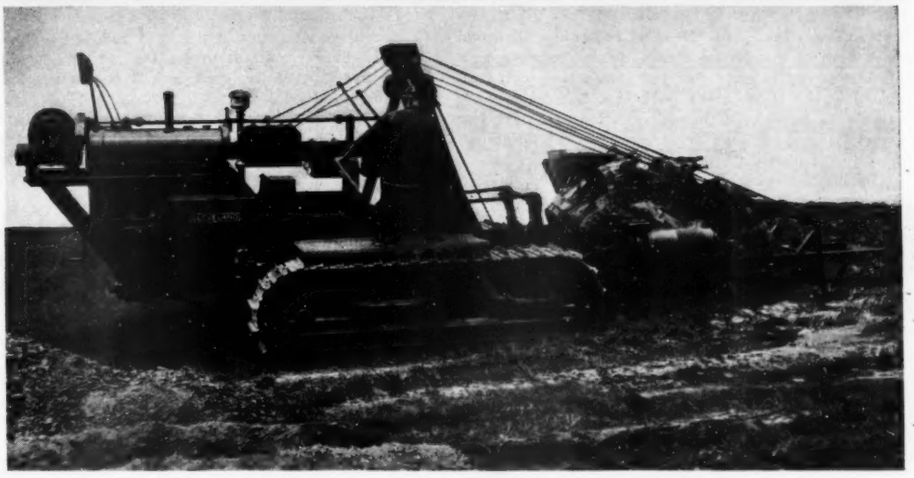

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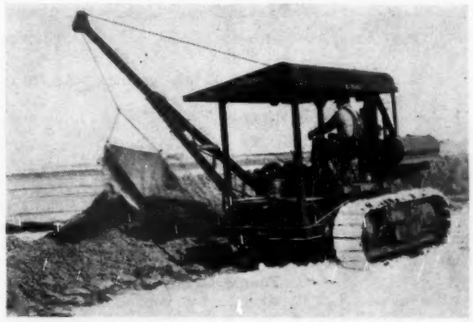

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For real savings put the Model "90" on your pipeline jobs.

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First of Expected 50 Tests Get Under Way in Play

By R. MARNE SANFORD

DALLAS, Tex., Jan. 27—The beginning of actual work at the Eastern Texas district's many recently staked and recently rumored exploratory tests indicated at the close of the week that if the pace continues to increase in intensity during the next few weeks, there will soon be as many as 50 wildcats active in the district.

During the week more work was started on two deep tests in Rusk County, one projected to 8,000 ft. and the other to 8,200 ft. These depths are expected to take them well into the lower Trinity series. Three miles north of Henderson in Rusk County, Delta Drilling Co. is preparing to spud 1 Kangerga Brothers, on a 113-acre tract in the R. Lane Survey. Contracted to 8,000 ft., it is on a site picked for a deep test more than a year ago. A gas line for fuel has been laid to the drill-site and heavy rotary is rigged up for the drilling.

Also in Rusk County, Skelly Oil Co. is building roads to 1 Markey, in the Nolan Survey, 4 miles southwest of Mt. Enterprise. This is a new 8,000-ft. test staked only last week. Both the Skelly test and the Delta Drilling Co. test are located on long-known but not deep-tested structures.

In Smith County just south of the Hawkins play in Wood County, Sells Petroleum Co. is preparing to mave in rig for the drilling of 1 C. J. McKay, located during the past in the Nathaniel Wren Survey, about 3 miles northwest of the town of Winona. It is a Woodbine sand test.

Also in north Smith County, Flanagan and Nicholson have set 9 in. casing at 1,141 ft. and are drilling ahead below 1,235 ft. at 1 P. Hale, in the Isaac Brock Survey, just outside of the town of Red Springs. It is a projected Woodbine sand test also.

Sun Oil Co. has started building derrick for its deep 7,000-ft. test on the Ore City prospect in Upshur County. Located definitely only last week, it is 1 W. C. Henderson, NW Cor. of a 27-acre tract in a 100-acre tract in the Robertson Asher Survey, less than ½-mile from the town of Ore City.

SUMMARY OF COMPLETIONS

East Texas Field

	No.	Bbl.	Footage
Oil wells: Gregg County	15	*755	53,803
Rusk County	6	*110	22,237
Upshur County	1	*82	3,660
Total	22		79,700

East Central Texas

(Daily production)

Oil wells: Talco field	2	640	8,573
Hawkins field	1	2,364	4,803
Dry holes: Wildcats	2		2,450
Total	5		15,826

*Per hour.

Hawkins Area

Attention was focused at three points in Hawkins in Wood County, one being Humble Oil & Refining Co.'s enlarged development program for its acreage, another being at the recent failure north of Hawkins which is being considered for deepening, and the other at a new outpost test for the Hawkins area.

At the close of the past week Humble announced that, in addition to its already announced two tests for the area, five more would start immediately. Three will be in the Willis Parker Survey, namely, 1 L. A. Bryan, NE Cor. of the tract 1 T. M. Dagnell, SW Cor. of the tract and an east offset to 1 Bryan and 1 W. T. Crow, SE Cor. of the tract. The other two include 1 Floyd K. Williams, 467 ft. from the west and 1,400 ft. from the south lines of the tract and in the B. N Hampton Survey, outpost to the east, and the 1 Ella Faulk, SW Cor. of the tract and in the James Pollock Survey.

Humble's two previously announced locations, both of which are being readied for immediate drilling, are 1 A. T. Clift, east offset to Manziel 1 Morrison and in the Pollock Survey, and 1 E. W. Moore, in the SE Cor. of the Pollock Survey.

An outpost failure for the Hawkins area, W. B. Johnson 1 Green, Moseley Survey, is being considered for deepening a second time. Finished as a failure at 4,828 ft. a week ago, it was deepened to 5,100 ft. the past week and again shut down. Plans for the second deepening are very indefinite.

The new operation in the Hawkins area is Bill Urbanic 1 J. A. Snider, NE Cor. of a 73-acre tract in the Castleberry Survey 1½ miles northeast of the town of Hawkins and between the town and the Johnson failure.

EAST TEXAS FIELD COMPLETIONS

Gregg County

Longview area: Bailey & Trimble 8 Jones, 63 bbl. an hr., 3,570-3,667 ft.
Bailey & Trimble 10 Jones, 65 bbl. an hr., 3,575-3,646 ft.
Hamil & Smith 6 Everett, 80 bbl. in 2 hr., 3,487-3,525 ft.
B. F. Phillips 2 Corbin, 60 bbl. an hr., 3,600-16 ft.
Prince Bros. 9 Williams, 92 bbl. in 32 min., 3,611-3,716 ft.
Trapp & Blankenship 4 Moseley, 60 bbl. an hr., 3,462-3,504 ft.
Kilgore area: Delta Drilling Co. 11 Crim, abandoned location.
Delta Drilling Co. 12 Crim, 250 bbl., pumping, 24 hr., 3,523-93 ft.
Fair 5-A Carr, 58 bbl. in 1½ hr. 3,452-88 ft.
Hall & Hall 6 Dickenson, 112 bbl. in 9 hr. 3,533-77 ft.
Julian Oil & Royalties 9 Endigna, 27 bbl. in 30 min., 3,503-55 ft.
J. F. Merrick 3 Laird, 60 bbl. an hr., 3,549-72 ft.
Nioca Oil 14 J. A. Knowles, 36 bbl. an hr., 3,544-80 ft.
Overton Ref. 22-B I.&G.N. R.R., 100 bbl. in 4 hr., 3,545-73 ft.
M. C. Trapp 8 King-Johnson, 20 bbl. in 40 min., 3,545-93 ft.
T. B. Wrather 7 Hughey, 100 bbl. in 5 hr., 3,554-97 ft.

Rusk County

Kilgore area: Sinclair Prairie 15-B Kennedy, 30 bbl. in 6 hr. swabbing, 3,633-3,710 ft.
Weaver-Crim 5-B Bean, 30 bbl. an hr., 3,664-3,700 ft.
Joiner area: G. V. Allen 2 Alford, 32 bbl. in 6 hr., 3,567-3,628 ft.
P. G. Lake, Inc., 22 Reid, 59 bbl. in 3 hr., 3,611-22 ft.
Shell 25-A Brooks, 20 bbl. an hr., swabbing, 3,668-3,767 ft.
G. H. Vaughn 14 Alford, 30 bbl. an hr., 3,745-3,810 ft.

Upshur County

Longview area: R. Lacey 24 Victory, 41 bbl. in 30 min., 3,658-60 ft.

EASTERN TEXAS WILDCAT REPORT

Anderson County

R. H. & W. Oil 1 Saunders, 17-acre tract in Joseph Ferguson Sur., in Frankston townsite, 5,000-ft. test, trying to free twisted drill pipe at 5,200 ft.
Texas 1 Greenwood, M. Salisar Sur., 4 mi. NW Palestine, drilling 2,100 ft.

Fannin County

Damon Oil 1 A. L. Chaffin, SW cor. 85-acre tract, J. Ketcham Sur., 4 mi. NE Bonham, location cleared, prepare move in materials.

Freestone County

C. W. Killough and E. B. Germany 1 Woolens, J. Ryan Sur., 9 mi. N Fairfield, S.D. for orders 1,897 ft.

Hill County

Rush & Sanders 1 Hutchinson, L. W. Williams Sur., 2 mi. SW of Mt. Calm, S.D. 570 ft.

Kaufman County

T. G. Shaw, trustee, 1 Agnes Wynne, B. S. Newman Sur., 8 mi. E of Kaufman, lower Trinity test, S.D. for high water 6,454 ft.

McLennan County

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, S.D. 712 ft.
Frank Place 1 Hackney, I. Robbins Sur., 4 mi. SE McGreggor, S.D.O. 650 ft.

Limestone County

Farrell Drlg. and Gulf Oil 1 F. Bevill, J. H. Murray Sur., 1 mi. SW of Horn, Travis Peak 4,892 ft., drilling 5,148 ft.
Hardin & Ames 1 Hammond, J. Folk Sur., 1½ mi. NW of Kosse, Glen Rose 4,290 ft., perf. casing in gas zone 5,805-10 ft. and 5,776-92 ft., bailed acid water and show oil, S.D. 5,955 ft.

Navarro County

Hargrave Oil 1 C. S. West, M. Boren Sur., 1½ mi. S Richland, T.D. 3,257 ft., salt water.

Raines County

Plains Prod. 1 W. D. Foster, T. Cummings Sur., 1 mi. NW Alba, top Woodbine 4,597 ft., checked 200 ft. low, preparing abandon, T.D. 4,617 ft.

Red River County

J. F. Morrissey 1 Tyler, James Miro Sur., 3½ mi. SE of Bogota, 5,000-ft. test, S.D. 2,910 ft., top sub-Clarksville 1,595 ft., Woodbine 1,960 ft.

Rusk County

Delta Drilling Co. 1 Kangerga, 113-acre tract in R. Lane Sur., 3 mi. N of Henderson, 8,200-ft. test, preparing spud.
Skelly Oil 1 Markey, Nolan Sur., 4 mi. SW Mount Enterprise, 8,000-ft. test, building road.

Smith County

O. L. Ross 1 Dr. Willingham, J. Herrin Sur., 2 mi. E Whitehouse, 10-in. at 110 ft., prepare to drill ahead.
Sells Pet. 1 C J. McKay, Nathaniel Wren Sur., 3 mi. NW Winona, Woodbine sand test, preparing move in materials.
Flanagan & Nicholson 1 P. Hale, Isaac Brock Sur., in Red Springs area, Woodbine test, 9-in. 1,141 ft., drilling 1,235 ft.

Trinity County

R. W. Burnett 1 Southern Pine Lumber Co., G. Ricardo Sur., 2 mi. N Apple Springs, moving in material.

Upshur County

Sun Oil 1 W. C. Henderson, NW cor. of 27-acre tract in 100-acre tract in Robertson Asher Sur., just outside town of Ore City, 7,000-ft. test, building derrick.

Wood County

Delta Drlg. Co. and Sells Pet. 1 Beckham, G. W. Cowan Sur., 4½ mi. NE of Mineola, drilling 4,468 ft.
Travis & Stoddard 1 Bryan, C. M. Patton Sur., 1½ mi. W. Hawkins, 467 ft. from N and E lines of survey, location.
W. L. Goldston 1 Osborne, H. S. Cobb Sur., 1 mi. SE Hawkins, 330 ft. from N and E lines of survey, abandoned hole, skidded derrick, preparing spud again at same location.
Bill Urbanic 1 J. A. Snider, NE cor. 73-acre tract in Castleberry Sur., 1½ mi. NE of Hawkins, location.

EAST CENTRAL TEXAS COMPLETIONS

(24-hour gages)

Franklin County

Talco field: Magnolia 3 Rutherford, 189 bbl. in 10 hr., open tubing, 4,249-66 ft.

Hill County

Wildcat: Rish & Saunders 1 Hutchinson, L. H. Williams Sur., 2 mi. SW Mount Calm, dry at 830 ft.

Lamar County

Wildcat: T. M. Parmley 1 Townsend, J. S. Porter Sur., 1½ mi. N Chicoto, dry at 1,620 ft.

Titus County

Talco field: W. B. Hinton 1 Blalock, 206 bbl. in 21 hr., pumping, 4,297-4,307 ft.

Wood County

Hawkins field: Hollandsworth Drilling Co. 1 Robbins, 197 bbl. in 2 hr., through perforation from 4,686-4,727 ft., 4,730-35 ft., top Nacatoch 2,318 ft., Pecan Gap 3,074 ft., Austin chalk 4,097 ft., Woodbine 4,398 ft., top gas 4,469 ft., oil 4,568 ft., T.D. 4,803 ft.

Kettleman Hills Is California's Leading Gas Field

The Kettleman North Dome field which is located in western Kings County and eastern Fresno County produces slightly more than 21 per cent of California's total monthly production of natural gasoline from seven natural-gasoline plants. In past years this field has produced a much larger percentage of the state's total natural-gasoline output. Kettleman North Dome likewise produces more natural gas than any other field in the state. The last reports available indicate that this field produces about 24 per cent of the total amount of natural gas conserved and charged to natural-gasoline plants for processing. Natural gas of this field is not especially rich but rather inclines to the lean side. Another distinction of the Kettleman North Dome field is that Superior Oil Co.'s natural-gasoline plant on the Huffman lease in Fresno County was the first natural-gasoline plant to employ refrigeration in the production of isobutane. The isobutane produced in this plant approximates 15,000 gal. daily and its purity makes it commercial isobutane. In addition to producing isobutane, Superior's Kettleman North Dome absorption plant produces about 50,000 gal. of natural gasoline daily. The distinction of this field as the largest single producer of isobutane, natural gasoline and natural gas in the State of California is due to the fact that the Temblor and Eocene sands produce large quantities of natural gas. The deeper zone now undergoing development is of Eocene age and its main characteristic is the production of large quantities of natural gas and small production of crude oil. These Eocene wells will produce 35,000,000 cu. ft. of gas and 350 bbl. of high-gravity crude oil daily.

MICHIGAN OPERATIONS

Fishing Job Delays Resumption Of Bay County Deep Test

By OTTO C. PRESSPRICH

SAGINAW, Mich., Jan. 27.—Midwinter doldrums continued in Michigan oil fields last week. Eleven completions resulted in five producing wells for combined daily initial potential of 603 bbl. a day, one small natural-gas well, second this year, and five dry holes.

Best completion and the second natural flowing well in Beaverton South field, Gladwin County, was Whitehill & Drury 2 Yager, in Section 36. Its production increased to 425 bbl. a day, after acid treatment, initial natural having been 10 bbl. an hour.

First effort to resume drilling on Gulf 1 Bateson deep test in Monitor Township, Bay County, was halted as an attempt to recover drill pipe failed. A fishing job was indicated to preserve the 7,776-ft. hole.

Another relatively deep test was continuing in Hamilton Township, Clare County, where Sun Oil Co. was nearing 5,000 ft. in 1 McIntosh of Section 16, at which depth officials expect to reach Sylvania sand. Monroe was topped at 3,901 ft. In Clare's Arthur Township, Section 8, American Drilling Co. 1 Cornwell wildcat was about to drill out the Dundee. It was below 4,050 ft. Acidizing was scheduled for Freeman Oil Co. 1-B Bicknell in Section 34, Redding of Clare. There was some natural production. Freeman's 1 Greeck in Section 35 of Clare's Grant Township was shut down below 1,300 ft., failing to show gas or oil at the top of the Michigan stray.

(Continued on Next Page)

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Allegan	1	60	1,606
Bay	1	40	2,847
Gladwin	1	425	3,855
Isabella	1	53	3,608
Ottawa	1	25	1,879
Gas wells: Montcalm	1	*1.45	1,294
Dry holes: Allegan	2	.....	2,984
Calhoun	1	.....	1,758
Montcalm	1	.....	1,339
Van Buren	1	.....	1,282
Total	11	.....	21,852

*Million cu. ft.

MISSISSIPPI AND SOUTHEAST

Extension to Tinsley Causes Proration Breakdown

By GEORGE WEBER

JACKSON, Miss., Jan. 27.—New leasing and proposed wildcat operations marked new activity in Mississippi and Alabama during a quiet week of exploration in the Southeast. A recurrence of excessive overproduction seems imminent again at Tinsley, with the production race extended to the southeast section of the field, south of the major fault, which heretofore has marked the southern limits of the overproduced section.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells	2	2,121	10,060

While crude from Tinsley has been moving to storage in varying quantities during the past several months, an agreement among operators to curtail production, brought a temporary decline from the top production of 25,500 bbl. daily last September. Production during the past week remained at approximately the same average as January runs to date—16,000 bbl. daily, but overproduction on a southeast lease may soon spread to offsetting properties and again augment the runs to storage.

Tinsley crude has found new outlets recently, but they are believed to entail price reductions. A large movement from South Louisiana storage recently was contracted for processing in a Houston, Tex., refinery, and other quantities accumulated from past overproduction are moving to the East Coast. In addition to the regular runs to the Standard Oil Co. of Louisiana refinery at Baton Rouge, current movements of Tinsley crude are destined for refineries at Vicksburg, Miss., and St. Elmo, Ill. Recently, 725,000 bbl. of Tinsley crude, including the above listings, were released from storage, and the weakened position of the crude inevitably entailed sales at prices substantially below the prices quoted by regular purchasers in the field.

Deep Test Is Located

A new deep test for Stone County, Mississippi, is announced by H. I. Morgan, who is moving a rig on 2 Dantzler Lumber Co., 4-4s-10w, for a second test of the large block. In Clarke County, F. E. Courson has made a tentative location on his 7,800-acre block for a test in 30-2n-14e. W. O. Allen proposes to drill a wildcat on the Smith & Viersen block in 1n-10 and 11e, Jasper County and in Kemper County A. G. Field is promoting a drilling operation in 12n-14 and 15e.

In Yazoo County, citizens of Deasonville have raised a fund to drill a test on a 1,000-acre school-land block in and around 16-11n-2e.

In contrast to the new proposed activity, Humble Oil & Refining Co. surrendered the option on acreage in Lamar, Marion and Pearl River counties, South Mississippi having explored the area with geophysics and apparently finding nothing of interest.

Jackson Gas Well Wild

Although of no commercial importance, a gas well blowout in the Jackson field last week attracted considerable interest. The City of Jackson 2 fee, located within the city limits blew out from a shallow gas pocket at 1,100 ft. blowing gas and salt water. The test had been abandoned after failing to find gas production in the Jackson zone and casing was being salvaged when the blowout occurred.

Alabama Activity

Wildcatting lags in Alabama, with most tests shut down. One new operation of interest has begun in North Alabama. In Limestone County, Shaw, Johnson & Thompson are drilling 1 Birmingham Trust & Savings Co. in 15-2s-4w. This is the first of several shallow tests planned on the 180,000-acre block held by the interests. The object of the cable-tool rig they are employing is the Trenton formation, which occurs at an estimated depth of from 200-650 ft. in that section of the county.

The first test is located 5 miles north of the town of Athens, on the Hays Mill structure. Since this is the first drilling in Limestone County, and the extent of acreage held and the proposed drilling of several tests indicates an extensive exploration of the area, operators will be watched with interest, and shallow subsurface information will contribute to the geological information in the little known area.

MISSISSIPPI COMPLETIONS

Tinsley—Yazoo County

Love Pet. Co. 2 Germany, NW SE 19-10-2, 1,389 bbl. through 23/64-in. choke, T.D. 5,015 ft., 7-in. casing 4,909 ft., Woodruff sand 4,909-99 ft.

Union 4 Harris, SW NW 30-10-3, 732 bbl. through 20/64-in. choke, T.P. 100 lb., C.P. 150 lb., T.D. 5,045 ft., 7-in. casing 5,035 ft., perf. 4,970-96 ft., Woodruff sand 4,925-5,001 ft.

MISSISSIPPI DRILLING REPORT

Clarke County

Walsingham & Earles 1 School Land, SW NW NE 16-4n-15e, S.D. 3,125 ft.

Issequena County

E. C. Johnston 1 Irby Charping, NE NW 29-10n-8w, (old well), old T.D. 5,020 ft., cored 5,021-23 ft., D.S. test 5,000-23 ft. recovered 630 ft. mud, 1,770 ft salt water in 10 min., ¼-in. chokes top and bottom, drilling 5,450 ft.

Montgomery County

E. R. Henderson 1 Columbian Mutual Life, 36-21n-5e. drilling 4,225 ft.

Sharkey County

British American 1 G. B. Houston est., S.D. 1,315 ft. in new hole.

Wildcat—Stone County

H. I. Morgan 1-C Dantzler Lumber Co., NE SE 4-4s-10w, first report.

Tishomingo County

Mellen & Gear 1 E. K. Wood, SE SE SE 21-4s-11e, drilling shale and dolomite 1,763 ft.

Tinsley—Yazoo County

Hassie Hunt 1 Stutts, NW SE 30-10-2, first report.
Slick-Urschel 14 Slick, SE SW 35-11-3, first report.
Union et al 2-A Childress, SE SW 24-10-3, first report.
Union 1 V. M. Perry, SE SE 10-10-3, first report.
Union 2 Childress Jones unit, SE SE 24-10-3, first report.
Union 6 Harris, NE NE 25-10-3, first report.

ALABAMA DRILLING REPORT

Wildcat—Limestone County

Shaw, Johnson & Thompson 1 Birmingham Trust & Savings Co., NW NE NW 15-2s-4w, drilling 256 ft.

Wildcat—Madison County

W. W. Newman 3 Nichols, NE NW NE 2-6s-2e, T.D. 280 ft., show oil and gas, S.D.

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Bradford, Pa., U. S. A.

World Production Sets Record Despite Reduction Outside U. S.

(Continued from Page 60)

rency was responsible for increased production in Trinidad and Canada.

Egypt and Hungary each increased their production last year, the former by 50 per cent and the latter by approximately 100 per cent. Exploitation of the Ras Gharib field in the northern part of Egypt modified the import requirements of that country and Hungary is now practically self-sufficient in petroleum supplies. The Hungarian-American Oil Co., an affiliate of the Standard Oil Co. (New Jersey) has completed approximately 50 wells in the Lispe field in the southwestern part of Hungary. Another producing field about 11 miles north of Lispe, near Lovaczy, is reported among the 1940 discoveries. Hungarian production was at the rate of about 6,000 bbl. daily when the year ended.

Increases in Argentina and Colombia were significant in analyzing the decline in Venezuela since crude from all three countries compete in the same orbit. Argentina increased its crude-oil production approximately 10 or 11 per cent but the country is still dependent on imports for approximately 40 per cent of its total consumption. The greater domestic production, however, canceled about 2,000,000 bbl. of oil that was imported in 1939 and this deficit was absorbed largely by Venezuela. More intensive exploration in the Comodoro Rivadavia field on the eastern coast of Argentina and the Province of Mendoza in the western part of the country were the chief contributors to higher national production. A new discovery near Barranca in Mendoza was completed in late December for production of 700 bbl. daily at 7,550 ft. The new Barranca discovery is 30 miles from the Tupungato field which was the chief contributor of increased production from the Province of Mendoza in 1940.

Colombian production increased by a daily average of 3,663 bbl. last year because of regular withdrawals from the Barco concession in the eastern part of the country. Colombian Petroleum Co. produced approximately 12,000 bbl. daily in 1940, which was sent into world markets through the South American Gulf Pipe Line Co. system terminating at Covenas. The increased output from Colombia, plus the amount normally exported to Europe but repulsed by war in 1940, went into direct competition with Venezuelan crude. Impact of higher production from Colombia was modified by a reduction of 3,251 bbl. in daily output from Peru.

Appalachian Fields

(Continued from Page 210)

H. B. Scott et al 1 Silas Provins, 1,025 ft.
Judson Bell et al 2 E. R. Gabler, 140 ft.
Greensboro Gas 1 Charles Hopton, 1,750 ft.
Greensboro Gas 1 Longenecker heirs, spudding.
Brummage et al 1 Robert Whooley, rig standing.
John Conklin et al 1 S. L. Mastrezar, building rig.
Morris Township: Romney Rutan et al 1 I. J. Clutter, Big Injun 2,118 ft.; gas gaging 25,000 cu. ft. per day at 2,203 ft., drilling 2,350 ft.
Richhill Township: Manufacturers Light & Heat 1 William Hughes, 2,250 ft.

Indiana County

Armstrong Township: T. W. Phillips 1 Lewis Weiss, rig.
Brush Valley Township: T. W. Phillips 1 Loman Penrod, 1,100 ft.
T. W. Phillips 1 F. M. Ramsey, 2,915 ft.
Center Township: T. W. Phillips 2 A. L. Light, 785 ft.
T. W. Phillips 1 Charles Johnston, building rig.
North Mahoning Township: John Wray et al 1 Floyd Stear, 2,300 ft.
Washington Township: Peoples 1 R. Bates, 2,664 ft.
T. W. Phillips 1 Al D. Fairman, 1,320 ft.

Washington County

Amwell Township: Carnegie 1 D. C. Blake, Fifty-foot sand 2,519 ft., gas gaging 52,000 cu. ft. a day 2,604-07 ft., drilling 2,635 ft.
Hanover Township: D. D. Caldwell & Co. 3 Evaline Caldwell, 1,325 ft.
Morris Township: Carnegie 1 Nelan heirs, 435 ft.
Carnegie 2 Nelan heirs, building rig.
North Strabane Township: Carnegie 1 Clell Gilkerson, 675 ft.
South Franklin Township: Foley & Williams 2 Clarence Van Kirk, 1,550 ft.
West Bethlehem Township: J. D. Amos 1 Frank Myers, 2,812 ft.
West Finley Township: Natural Gas of W. Va. 1 Robert Marshall, 200 ft.

Westmoreland County

Allegheny Township: Peoples 1 Howard Wise, rig completed.
Bell Township: Dome Gas 2 J. F. Wolford, 1,283 ft.
Peoples 1 Pearl Ellwood, 3,210 ft.
Peoples 2 John McCreary, 390 ft.
Upper Burrell Township: Peoples 1 J. P. Fitzgerald, 944 ft.
Washington Township: Peoples 1 John and Jacob Weister, rigged up.

WEST VIRGINIA

In Ravenswood district, Jackson County, Columbian Carbon Co. ran casing and cemented in the Corniferous lime topped at 5,170 ft. in the wildcat on the F. F. Starcher farm. While waiting for the cement to set operators started pulling the outside strings. The derrick collapsed and is being rebuilt. Their test on the F. L. Roliff farm is drilling at 4,154 ft. The Boggess Drilling Co. has reached 1,100 ft. and fishing in No. 1 Mary Smith farm. This test is intended to pick the Berea oil found in the adjoining farm of H. L. Tallman.

In Poca district, Kanawha County, no hole was made in the two tests drilling down to the Clinton sand, both being delayed by bad fishing jobs.

In Harrison County the rotary test of Peoples Natural Gas Co. on the C. S. Gribble farm is drilling at 9,807 ft. and a string of casing has been ordered for the hole.

Braxton County

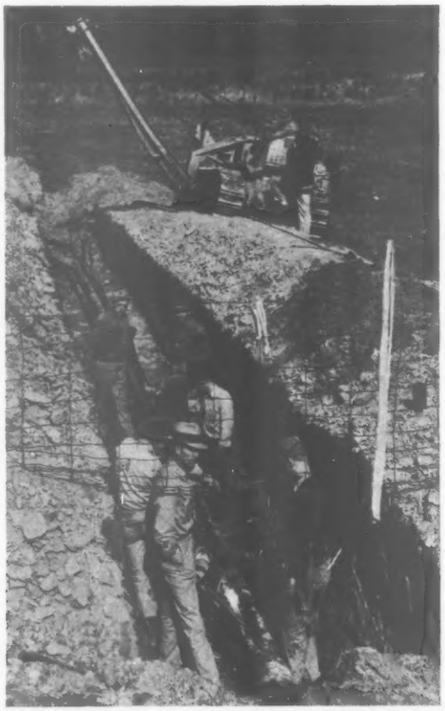
Birch district: Pittsburgh & W. Va. Gas 7770 Ida Young, dry, Injun sand, T.D. 2,052 ft.
Pittsburgh & W. Va. Gas 7772 Fred L. Fox, dry, Injun sand, T.D. 2,020 ft.

Cabell County

McComas district: West Virginia Gas 1 Noah Hay, 180,000 cu. ft. gas; Brown shale, T.D. 3,220 ft.

Clay County

Otter district: Pittsburgh & W. Va. Gas 7765 Ed L. Boggs, dry, Injun sand, T.D. 2,045 ft.



Laying two 4-in. lines at a crossing for a lateral to Weedsport, N. Y., during the construction of the gasoline pipe line which has been recently completed for Socony-Vacuum Oil Co., Inc. The line connects Buffalo and Syracuse in western New York. Three laterals of the same type were laid from the 6-in. trunk line; Rochester is connected with the trunk line by a 6-in. lateral. By having the laterals consist of two lines, it is possible to use one of the lines for high-gravity products and the other for low-gravity products. An article describing the construction of this line appeared on Page 34 of the December 5 issue of The Oil and Gas Journal

Fayette County

Falls district: Northeastern Oil & Gas 61 Venetta Land Co., 25,083 cu. ft. gas, through Injun sand, T.D. 1,700 ft.

Gilmer County

Troy district: F. G. Bish 3 B. S. Messenger, 37,320 cu. ft. gas, Big Injun 1,790-1,883 ft., gas 1,865 ft., T.D. 1,890 ft.

Taylor County

Booth Creek district: Pittsburgh & W. Va. Gas 6119 Fannie R. Brightwell, small gas well, Big Injun sand 827-60 ft., T.D. 2,505 ft.

Wirt County

Burning Springs district: Oil City Trust 14 Kidwell heirs, dry, Injun sand, T.D. 1,051 ft.

ORISKANY GAS FIELDS

Kanawha County

Poca district: Poca Fork 1 Siegle Moore, 2,113,000 cu. ft. gas, Corniferous lime 5,199-5,319 ft., Oriskany 5,319 ft., gas 5,339-46 ft.
South Penn 1 G. W. Burdette, 1,500,000 cu. ft. gas, Big lime, T.D. 1,669 ft.

DRILLING

Poca district: Godfrey L. Cabot 5 J. L. McLean heirs, top Corniferous lime 4,871 ft., steel line.
Godfrey L. Cabot 7 J. L. McLean heirs, top Oriskany 5,115 ft., S.D. 5,119 ft. to install control head.

NEW WORK

Braxton County

Birch district: Pittsburgh & W. Va. Gas 7788 Ed L. Boggs, elev. 830 ft.
Pittsburgh & W. Va. Gas 7789 Ed L. Boggs, elev. 972 ft.

Calhoun County

Sherman district: Gunn, Gainer & Gunn 1 Stella Frame, elev. 930 ft.

Cabell County

Grant district: Monickel Gas Co. 1 George A. Alexander, elev. 688 ft.

Gilmer County

Glenville district: Pittsburgh & W. Va. Gas 7737 O. F. Wolfe, elev. 887 ft.
Troy district: P. G. Loudin 1 Anderson Butcher, elev. 794.5 ft.

Kanawha County

Poca district: South Penn 2 G. W. Burdette.
South Penn 1 Martha J. Wines, elev. 812.59 ft.
United Carbon Co. 1 J. C. Crowder et al.

Lincoln County

Union district: Huntington Development 1 W. G. Adkins, elev. 790 ft.

Putnam County

Curry district: United Fuel Gas 1 C. H. Zerkle, elev. 975 ft.

Michigan Fields

(Continued from Preceding Page)

Promising a 1-mile extension of the Tallmadge-Georgetown field in Ottawa County was Fisher-McCall Oil & Gas 1 Wells in Section 1, Georgetown. An oil pay was under test at 1,888 ft. That area, meanwhile, continued as one of the state's most active, six tests starting as a result of completion of Smith Petroleum Co. 4 Visser, best flowing well ever drilled in the western Tallmadge section.

New drilling continued generally at its below-1940 rate, the state Conservation Department issuing 15 permits during the week, Allegan getting five; Montcalm, Muskegon and Van Buren, two each; Alpena, Clare, Gratiot and Ottawa counties, one each. The total for the year stood at 50.

MICHIGAN COMPLETIONS

Allegan County

Salem Township: Universal Gas & Oil 2 Smith, NW NW NE 15-4n-13w, 60 bbl., acid, T.D. 1,606 ft.
R. D. Malcolm 1 Selby, NW NE SE 22-4n-13w, dry, T.D. 1,628 ft.
Trowbridge Township: S. L. Conant 1 Russell, NW SW SW 28-1n-13w, dry, T.D. 1,356 ft.

Bay County

Monitor Township: L. C. McGregor 1 Kircher, NW SW NE 2-14n-4e, 50 bbl., acid, T.D. 2,847 ft.

Calhoun County

Sheridan Township: Muskegon Development 1 Allison, SW SW NW 15-2s-4w, dry, T.D. 1,758 ft.

Gladwin County

Beaverton Township: Whitehill & Drury 2 Yager, SW NW NE 36-17n-2w, 425 bbl., acid, T.D. 3,855 ft.

Isabella County

Broomfield Township: Pure Oil Co. 7-B Embry, S½ S½ NW 3-14n-6w, 53 bbl., acid, T.D. 3,608 ft.

Montcalm County

Belvidere Township: Belvidere Oil Co. 1 Hillman, NE SW SW 17-12n-7w, 1,450,000 cu. ft. natural gas, T.D. 1,294 ft.
Home Township: Belvidere Oil Co. 1 Towle, NW SE SW 12-12n-6w, dry, T.D. 1,339 ft.

Ottawa County

Tallmadge Township: Mesel & Spielberg 6 Lipski, NE SE SW 14-7n-13w, 25 bbl., acid, T.D. 1,879 ft.

Van Buren County

Bloomingdale Township: Clapsaddle & Harris 1 Joy, SW SW NE 4-1s-14w, dry, T.D. 1,282 ft.

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1940-41 High	1940-41 Low	Week ended Jan. 25 High	Week ended Jan. 25 Low	Week ended Jan. 25 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1939	Com. sh. earn. 1938	1939 High	1939 Low	1938 High	1938 Low
58½	38½	50⅜	49	50⅜	Amerada Corp.	788,675	N.P.	50cQ	1-31-41	$2.00	$1.56	$2.07	74½	50	78	55
27⅛	18¼	23⅝	23⅛	23⅜	Atlantic Refining	2,663,999	$25	25cQ	12-16-40	1.00	1.66	1.40	24¾	18⅛	27⅝	17¾
16⅝	8½	9½	9¼	9⅜	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.50	1.39	—.85	21	10¼	23¾	12⅛
13⅜	7⅛	9	8⅝	9	Barnsdall Oil Co.	2,558,779	$5	15c	12-9-40	.60	.76	1.26	19½	11⅛	21⅜	10⅛
8⅛	5½	5⅞	5⅝	5⅝	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	2-15-41	.72½	.55	.55	9⅞	6½	10⅜	7
25	16⅛	19⅞	19	19½	Continental Oil of Delaware	4,682,572	$5	25cQ	12-23-40	1.00	1.35	1.10	31½	19⅞	35¾	21¼
6⅞	3⅜	4¼	4	4⅛	Houston Oil	1,098,618	$25		10-17-30		.43	.83	9⅜	4½	9¾	5
14⅜	9	10⅝	10½	10½	Lion Oil Refining	435,815	N.P.	25cQ	12-31-40	1.00	1.50	2.09	18⅛	10	25⅛	15⅝
17⅜	11½	15⅛	14½	15	Mid-Continent Petroleum	1,857,912	$10	40c	12-2-40	.80	1.42	.56	18	11⅛	22⅝	12¼
11¾	7⅛	10⅝	10⅛	10⅛	Mission Corporation	1,378,645	$10	25c	12-20-40	.25	.87	1.04	14⅞	8¾	17¾	10⅝
9¾	4⅝	6⅛	5⅞	6⅛	National Supply	1,155,517	$10		12-22-37		—.87	—.79	15½	5⅝	23	12½
8¾	5⅜	7⅝	7⅛	7⅝	Ohio Oil Co.	6,563,377	N.P.	25c	12-14-40	....	—.10	.25	10½	6	14⅞	8⅞
8⅞	5½	6⅝	6⅝	6⅝	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	....	.81	1.22	11⅞	7	15⅞	10¼
10½	6¾	..	..	..	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	.25	1.10	.08	8¾	5	9¼	6¼
41¾	27⅛	38	37	37⅜	Phillips Petroleum	4,449,052	N.P.	50cQ	11-30-40	2.00	2.21	2.03	46½	31¼	44⅜	27¼
22¾	15	16¾	15⅞	16⅛	Plymouth Oil Co.	1,038,633	$5	25c‡	12-23-40	‡1.30	2.38	2.59	24	17⅛	25⅜	15
11½	6¾	8¼	8	8	Pure Oil Co.	3,982,031	N.P.	25c	12-20-40	.25	1.11	.38	11¾	6½	13½	8¼
9¼	5⅞	9	8¾	9	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.65	.51	10¼	6⅝	9⅞	5
20	11	15	14¼	15	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	12-14-40	1.00	1.40	1.52	24⅜	15½	27½	15½
13⅛	7⅝	11⅜	10⅛	10⅞	Shell Union Oil	13,070,625	N.P.	50c	12-20-40	.75	.77	.72	17¼	9⅞	18⅜	10
23¼	12¼	20½	20	20½	Skelly Oil	995,349	$15	50c	12-20-40	1.25	1.99	2.27	29½	15½	34¾	18½
12½	7⅛	9⅛	8¾	9⅛	Socony-Vacuum	31,206,071	$15	25cSA	9-16-40	.50	1.10	1.29	15⅛	10¼	16⅝	10⅜
26⅛	16¼	19⅜	18¾	19¼	Standard Oil of California	13,003,953	N.P.	25cQ	12-16-40	1.00	1.38	2.22	33⅝	24¼	34⅞	25⅛
29	20¾	27⅜	26¾	27⅜	Standard Oil (Indiana)	15,272,020	$25	50c†	12-16-40	1.50	2.23	1.82	30	22¾	35½	24¾
46½	29⅞	34⅞	33⅞	34¾	Standard Oil of New Jersey	27,280,998	$25	75c†	12-16-40	1.75	3.26	2.86	53½	38	58⅜	39¾
65⅞	46¾	58½	55½	57½	Sun Oil	2,434,863	N.P.	25cQ	12-16-40	*1.00	2.74	1.07	66	45¾	65½	45
2½	1⅛	1⅝	1⅝	1⅝	Superior Oil Corp.	1,388,979	$1	10c	12-28-40	.10	.04	.24	3⅝	1¾	4¼	1⅝
47⅝	33	38½	36⅝	38½	Texas Corp.	10,876,139	$25	50cQ	1-2-41	2.00	3.02	2.13	50¾	32½	49⅝	32⅝
4¼	2½	3⅛	3	3⅛	Texas Gulf Producing Co.	888,147	N.P.	10c	12-14-40	.20	.69	.86	5¾	3¼	5⅞	2⅝
8⅝	5⅜	6	5⅞	5⅞	Texas Pacific Coal & Oil	888,236	$10	10c	12-2-40	.40	1.00	1.16	11⅜	7	12½	7
12	8¾	10	9⅝	9⅞	Tide Water Associated	6,371,827	$10	15c	12-2-40	.70	1.05	1.28	14¼	9½	15¾	10⅛
17½	12	14¼	13⅝	13¾	Union Oil Co. of California	4,666,270	$25	25c	2-15-41	1.00	1.25	1.47	19¾	15⅛	22½	17⅛
29⅞	22¾	..	..	..	Union Tank Car Co.	1,177,381	N.P.	45c	12-2-40	1.75	2.07	1.16	24¼	20⅛	23½	20
3⅝	1¾	1⅞	1¾	1¾	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.77	.52	4¼	2⅜	3½	1⅝

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. —Deficit.

New York Curb Exchange

1940-41 High	1940-41 Low	Week ended Jan. 25 High	Week ended Jan. 25 Low	Week ended Jan. 25 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1939	Com. sh. earn. 1938	1939 High	1939 Low	1938 High	1938 Low
10¾	4½	6¾	6½	6⅝	American Republics Corp.	1,308,049	$10	25c	12-18-40	....	$0.14	—.22	11¾	5½	11¾	5
3¼	1⅜	..	..	..	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.95	—.14	7¼	2½	10¼	4⅜
43	28	..	..	..	Buckeye Pipe Line Co.	200,000	$50	$1	12-14-40	$4.00	3.13	2.36	34¾	26½	39	22½
117	95	110¼	110¼	110¼	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	12-16-40	6.00	7.87	5.32	130	108⅝	128	97
6¾	4	4¾	4½	4⅝	Cities Service (new)	3,703,978	$10	....	6-1-32	....	.68	.23	9¼	4¼	11	5⅛
2⅛	⅝	⅝	⅝	⅝	Cosden Petroleum	465,332	$1	....	.....	....	....	....	2¼	½	2⅜	⅞
24¼	11⅝	15	14⅝	15	Creole Petroleum	6,974,356	$5	50cSA†	12-16-40	1.00	1.38	1.64	28	16¾	27½	17½
4⅜	2⅞	..	..	..	Darby Petroleum	351,390	$5	25cSA	1-15-39	....	.03	.69	7⅛	3⅝	10¼	5⅛
2	¾	1	1	1	Derby Oil & Refining	263,162	N.P.	....	.....	....	—.37	—.91	2⅝	1½	3½	1⅛
31	20¼	24¾	24¾	24¾	Eureka Pipe Line	50,000	$50	$3.50	2-1-41	2.25	.63	—.37	23	15⅛	31	16
39⅞	25⅛	32¾	31¾	32½	Gulf Oil Corp.	9,076,202	$25	25cQ	12-27-40	1.25	1.69	1.43	45⅛	29¼	46⅞	33
68	47⅛	59	58⅜	59	Humble Oil & Refining	8,987,840	N.P.	62½c	12-26-40	2.00	3.33	3.98	71	52½	72⅝	56
12⅜	5⅜	6⅝	6⅝	6⅝	Imperial Oil of Canada	26,965,078	N.P.	25c	12-2-40	.62½	.71	.96	17	11⅜	19½	14⅛
7¾	3	..	..	..	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	*2.80	.33	.47	7¼	5½	9⅜	6
19¾	8¼	10¼	9⅞	10¼	International Petroleum	14,324,088	N.P.	30c	12-21-40	1.25	1.19	1.98	27½	17	31¼	21
2¾	1⅝	..	..	..	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.06	.14	3¾	2⅛	5	2¼
10¾	7⅝	10⅛	10	10⅛	Lone Star Gas	5,518,347	N.P.	30c	12-21-40	.70	.98	.88	10½	7⅛	10⅝	6⅝
6¼	3¾	4½	4¼	4½	Louisiana Land & Exp.	2,966,762	$1	5c	12-16-40	.35	.22	.45	7¾	4	9⅜	6½
17	9¼	10	10	10	Margay Oil Corp.	149,943	N.P.	25cQ	1-10-41	1.00	1.52	2.28	17	14½	24	16
8½	6½	7½	7½	7½	Midwest Oil Co.	998,474	$10	45c	12-16-40	.90	.99	.93	8¾	6⅝	9¾	6⅝
6¼	4⅞	5⅜	5⅜	5⅜	Mountain Producers	1,593,584	$10	30cSA	12-16-40	.60	.70	.62	6	4⅞	5⅜	4½
13⅛	10	12⅜	11½	12	National Fuel Gas	3,810,183	N.P.	25cQ	1-15-31	1.00	.95	.84	14	11¼	14⅝	11½
12¾	8¾	12½	12	12	National Transit	509,000	$12.50	50c	12-16-40	1.00	.91	.88	9½	7¼	9¼	6½
1¼	¾	1	1	1	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1¾	1	2⅝	1½
7¾	5¼	7	6⅝	7	New York Transit	100,000	$5	25c	9-20-40	.60	.88	.16	6	4	4½	3½
9⅞	6	9	9	9	Northern Pipe Line	120,000	$10	40c	12-2-40	.80	.31	.24	7	4½	6	4
5½	2½	3⅛	3	3	Pantepec Oil	2,856,872	$1	...	.....	....	....	....	7⅝	4	7¾	3½
3¼	1	1¼	1	1⅛	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.70	.17	5	1¼	4½	1⅝
3	1½	..	..	..	Ryan Consolidated	298,931	N.P.	10c	12-28-40	....	.16	.29	3	1⅞	4	2⅛
11¾	4¾	7⅞	7⅞	7⅞	Southern Pipe Line	100,000	$10	25c	9-3-40	.50	.25	—.27	4⅞	3½	5⅜	3¼
44	28	37¾	37½	37¾	South Penn Oil	1,000,000	$25	$1.87½†	12-20-40	2.50	2.84	1.44	40½	26¾	39	28¾
35	21	28	28	28	Southwest Penna. Pipe Lines	35,000	$50	50c	12-26-40	6.50	2.06	—.41	23	18	22¼	16½
20⅞	16½	20½	19¾	20	Standard Oil of Kentucky	2,604,790	$10	55c†	12-16-40	1.30	1.53	1.45	20⅛	17¼	18¾	15
41¾	26¼	38½	37½	37½	Standard Oil of Ohio	753,740	$25	$1.25†	12-14-40	2.00	6.64	1.81	32¾	17	22¾	16¼
2	1⅜	1½	1½	1½	Sunray Oil	1,975,876	$1	5c	12-20-40	.10	.25	.23	2¾	1¾	3¼	2
3⅛	2	2⅞	2⅞	2⅞	Texon Oil & Land	936,024	$2	10c	12-30-40	.40	.49	.56	4	2⅝	5¼	3½
3⅜	2	2½	2½	2½	Transwestern Oil Co.	750,000	$10	....	.....	....	—1.42	.12	6	2½	5¼	2⅝
2⅛	¾	⅞	¾	‡¾	United Gas Corp.	7,818,959	$1	....	.....	....	—.55	—.51	3⅜	1½	5¼	2⅝

*Includes $2.50 capital distribution. †Includes extras. —Deficit.

Personal Paragraphs

C. H. Wagner, E. R. Turner, Dr. Robert E. Wilson and C. F. Hatmaker, visitors at Houston, Tex., last week

FRANK BUTTRAM, president, and RUSSELL BROWN, chief counsel, of the Independent Petroleum Association of America with offices in Tulsa, spent several days in California this week meeting California oil producers.

RAY KELCHENSTEIN, formerly stationed in the East Texas field as farm boss for Magnolia Petroleum Co., has been transferred to West Texas where he will direct the company's operations in the recently opened Abell field in Pecos County.

JAMES WAINRIGHT FLANAGAN, director, International Petroleum Co., has been appointed an honorary colonel of the Irish Regiment of Canada. The appointment recognized the growing cooperation between the United States and Canada in defense matters. Mr. Flanagan, an American citizen, has resided in Toronto since 1925.

B. G. WEEKES, scout with Union Sulphur Co., is being moved from Mississippi to Lake Charles, La.

WINTHROP ROCKEFELLER, of the foreign department, Socony-Vacuum Oil Co., was inducted into the U. S. Army last week for a year of military service.

J. W. CARNES, vice president in charge of marketing, Sinclair Refining Co., is still hospitalized in Mount Vernon, N. Y., with a complicated fracture of his arm.

W. R. WALLACE, chief counsel, Magnolia Petroleum Co., Oklahoma City, Okla., was the principal speaker at a meeting of the Kansas Independent Oil and Gas Association at Wichita, last Friday night.

K. J. SMITH, general manager of Skelly Oil Co.'s El Dorado, Kans., refinery, was a 1-day Tulsa visitor at the executive offices of the company on Wednesday of the past week.

L. L. DREVESKRACHT, geologist for the Tide Water Oil Co., has moved from the company's offices in Houston, Tex., to those at Wichita, Kans. He and his family of three made the change in the past week.

C. L. SUHR, chairman of the board of the Pennzoil Co., Oil City, Pa., has been named by Gov. Arthur H. James, of Pennsylvania, as a member of the five-man state housing board to coordinate the work of the various housing authorities of the state.

KARL H. HASSELMANN, president of the Salt Dome Oil Corp., Houston, Tex., has returned to Houston from a business and pleasure trip to New York.

JAMES W. REES, office and employment manager of Pure Oil Co.'s Chicago offices, has assumed duties as assistant general purchasing agent of the company. Mr. Rees lives in Evanston, Ill., and will continue to make his headquarters in Chicago. He has been with Pure since 1925.

EDWARD H. CHANDLER, counsel for Sinclair Prairie Oil Marketing Co., has been named guardian for Eugene B. Marlow, Jr., 9 years old, whose parents were killed in an automobile accident near Sullivan, Mo., December 27. Mr. Marlow was vice president of the Sinclair Prairie Company, and a long-time friend of Mr. Chandler.

DR. ROBERT E. WILSON, chairman of the board of Pan American Petroleum & Transport Co., and president of American Oil Co., New York, C. H. WAGNER, Baltimore, Md., general manager, American Oil Co., marketing subsidiary of American Petroleum & Transport Co.; and C. F. HATMAKER, vice president of American Oil Co., headed a group of about 30 sales and division managers, chemists, technical and advertising men of American Oil Co., who spent last Friday and Saturday visiting Houston offices of the Pan American Production Co. and Pan American Pipe Line Co., nearby production and pipeline properties of these companies, and Pan American Refining Co.'s refinery at Texas City. At Houston the party was joined by D. J. SMITH, vice president, Pan American Refining Co.; P. J. SWEENY, manager of the Texas City refinery; and E. R. TURNER, vice president and general manager of the Pan American production and pipe-line companies.

A. JACOBSEN, president of Amerada Corp., New York City, was a visitor in Tulsa last week.

E. H. COURTNEY, scout with Fohs Oil Co., is transferring from Jackson, Miss., to Lake Charles, La.

REGINALD G. RYAN, formerly with Tide Water Associated Oil Co., and later a consulting geologist at Baton Rouge, La., has moved to Houston, Tex.

PARKER F. DAVIS, Texas Pipe Line Co., has been elected president of the Petroleum Electric Club of Tulsa, and will be installed February 4.

M. R. HOY, civil engineer of the United Natural Gas Co., Oil City, Pa., will be retired by that concern on January 31, after 28 years of service. He entered the employ of the company in 1913 after being employed since 1897 by the National Transit Co. His service with that firm was interrupted by service in the Spanish-American war. He was honored at a dinner, attended by 120 fellow workers and friends, at the Wanango Country Club on January 22.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

The House committee on rules was handed a resolution calling for investigation of gasoline prices.

The British Navy seized the United States flag tanker "Petrolite" on the high seas, interrupting a voyage to Copenhagen, a neutral port. British justified their interception of the cargo on the grounds that the oil might eventually reach Germany.

20 YEARS AGO

The Welsback Street Lighting Co. of America notified the mayor of Kansas City it proposed to quit lighting gas street lamps claiming that the service fee of $9 per year for each lamp was insufficient.

Texas' deepest oil test, and the fifth deepest in the world, Ryan Petroleum Co. 1 Henderson, near Ozona in Crockett County, was abandoned at 5,908 ft.

Isopropyl alcohol made its initial appearance as a petroleum derivative under the trade name of "Petrohol." An important future in the industrial arts was predicted for the hydrocarbon.

10 YEARS AGO

Refiners in 1930 received exceptionally low prices for most of their products. The annual survey revealed that 58-60 U. S. Motor gasoline sold for an average of 6.34 cents per gallon.

Senator Nye of North Dakota proposed investigation of the oil industry to determine whether prices of crude oil and gasoline are being affected by agreements.

Another large discovery added the third Woodbine sand pool in the new producing area of East Texas. A few geologists predicted that the three would eventually link to make up the world's greatest oil field.

E. P. HAYES, chief engineer in the South Texas division of the Texas Co., Houston, Tex., has returned to his desk after spending the past month visiting the various division and district offices.

H. S. CHRISTIAN, formerly with Plaza Oil Co., Tyler, Tex., together with BEN T. HEAD and BEN T. HEAD, JR., has incorporated the Mid-South Refining Co., of Jackson, Miss., and plans to enter refining in that state.

WILLIAM J. MURRAY, JR., formerly an engineer in the Oil and Gas Division of the Texas Railroad Commission, has been appointed the division's chief enforcement officer. He replaces A. G. CARTER, who resigned to enter private business.

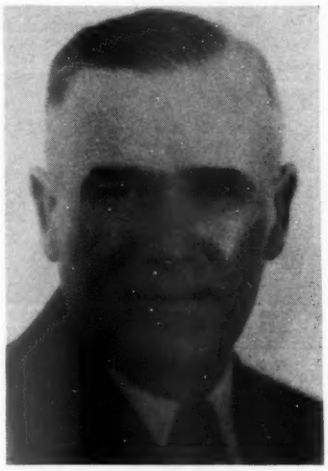
EDWIN L. LUCAS, a member of the pipe-line department of Standard Oil Co., with offices in Los Angeles, and who has been on special duty for several years, recently completed 30 years of uninterrupted service and received a pin commemorating his service with the company.

R. E. KING, Shell Oil Co., Inc., Midland, Tex., has been elected president for 1941 of the West Texas Geological Society. Vice president is FRED F. KOTYZA, with Tide Water Associated Oil Co., and secretary-treasurer is W. G. MOXEY, with Stanolind Oil & Gas Co.

C. H. FIDLER, scout and land man with Tide Water Associated Oil Co., Jackson, Miss., has been transferred to Wichita, Kans., where he will be in the land department. He is succeeded in Jackson by W. H. CORDELL, who is transferred from Evansville, Ind., and W. E. THOMPSON of Hattiesburg, Miss., who will take over the duties of land man in the Jackson office.

Eight-Step Stairway

The stairway J. W. Folmar climbed to reach his present position as superintendent of Magnolia Petroleum Co.'s refinery at Fort Worth, Tex., consisted of eight distinct steps; however, the period of time embracing the steps represents more than 28 years of continuous service with the company.



J. W. FOLMAR

It was on August 8, 1912, that young Mr. Folmar, age 21, was employed as pipe fitter's helper at Magnolia's plant in Beaumont, Tex. He was later transferred to the operating department and thence made night foreman of the plant. After later being made assistant general foreman at Beaumont, Mr. Folmar was again promoted, this time to superintendent of the company's refinery at Corsicana, Tex. Later transferred back to Beaumont for a short period of time as foreman of the north plant in Beaumont, Mr. Folmar was, on April 1, 1939, transferred to Fort Worth, Tex., and appointed superintendent of the Fort Worth refinery. The stairway Mr. Folmar built for himself must have been a good one and of substantial construction for each step he made in the past 28 years was upward; each promotion earned and kept through merit.

The refinery at Fort Worth is in the process of rebuilding and enlargement at the present time and when finished will have a capacity of 20,000 bbl. daily. Superintending this work has kept Mr. Folmar unusually busy in recent weeks but when work is completed he will have under his supervision a very modern refining plant.

E. C. NIELSEN, with offices in Omaha, Neb., is in Los Angeles conferring with Socony-Vacuum officials but will return to his headquarters within the next few days.

PAUL BENEDUM, general manager in the Gulf Coast district for Benedum-Trees Oil Co., Houston, Tex., returned last week with his family from a hunting trip on the Rio Grande border near Laredo, Tex.

JACK LEWIS MINNER has been made manager of the fuel-oil sales department of Shell Oil Co., Inc. DR. RALPH T. GOODWIN, formerly manager of the fuel-oil sales, has been appointed manager of Shell's aviation department.

FRED HOGAN, independent oil operator of Midland, Tex., has been elected president of the Midland, Tex., Country Club for 1941. He succeeds JOHN W. HOUSE who was chosen the new vice president for the year.

A. L. WEIL, retiring president of the General Petroleum Corp. of California, was honored last week at a dinner at the California Club in Los Angeles. Hosts were members of the wildcat committee of the California Oil and Gas Association. Mr. Weil was presented with a silver cigaret box, engraved with the signatures of the wildcats.

S. W. DUHIG, vice president and treasurer of Shell Union Oil Corp., the oldest Shell employe in New York from point of service, was presented with a 35-year service award at a luncheon held at the Waldorf-Astoria Hotel last week. The luncheon was attended by 355 employes of the Shell head offices in New York. ALEXANDER FRASER, president, gave the luncheon and made the presentation to Mr. Duhig.

L. R. FORKER, of the Quaker State Oil Refining Corp., Oil City, Pa., president of the Purchasing Agents Association of Northwestern Pennsylvania, presided at the meeting of the association at Bradford, Pa., on January 16.

PAUL RYAN, president, National Refining Co., Cleveland, Ohio, who was injured in an airliner accident several weeks ago in Chicago, is still confined to a hospital in Chicago. His numerous fractures are mending well, and his other injuries are healing satisfactorily. It is expected that he can be moved to Cleveland within a month.

Shifts: J. S. ALLAIRE, superintendent, Humble Oil & Refining Co., from Hobbs, N. M., to Mineola, Tex.; J. E. WALKER, geologist, Shell Oil Co., Inc., from Athens, Tex., to Mineola, Tex.; H. E. GRANDBERRY, engineer, Magnolia Petroleum Co., from Waxahachie, Tex., to Palestine, Tex.; LEO J. GUDE, geologist, Coline Oil Corp., from Seagraves, Tex., to Oil Development Co. of Texas, Denver City, Tex.; JOSEPH A. HEALY, manager, land department, Belcher Production Co., from Miami, Fla., to Galveston, Tex.; R. G. KURTZ, geologist, Ohio Oil Co., from Flora, Ill., to Marshall, Ill.; W. M. BILLS, engineer, Sun Oil Co., from Biloxi, Miss., to Hattiesburg, Miss.; LEO W. KONZ, engineer, Carter Oil Co., from Ardmore, Okla., to Waurika, Okla.

T. E. JAMISON, Coleman, Tex., and CHARLES POLLARD, Fort Stockton, Tex., have purchased the holdings of the Ward-Pecos Petroleum Co. in Ward and Pecos counties in West Texas.

WILLIAM E. DAUGHERTY, assistant district geologist for Humble Oil & Refining Co. at Midland, Tex., has been elected vice president of the Midland Geological Society to succeed ROBERT L. BATES, who recently resigned to join the staff of the New Mexico Bureau of Mines at Socorro, N. M.

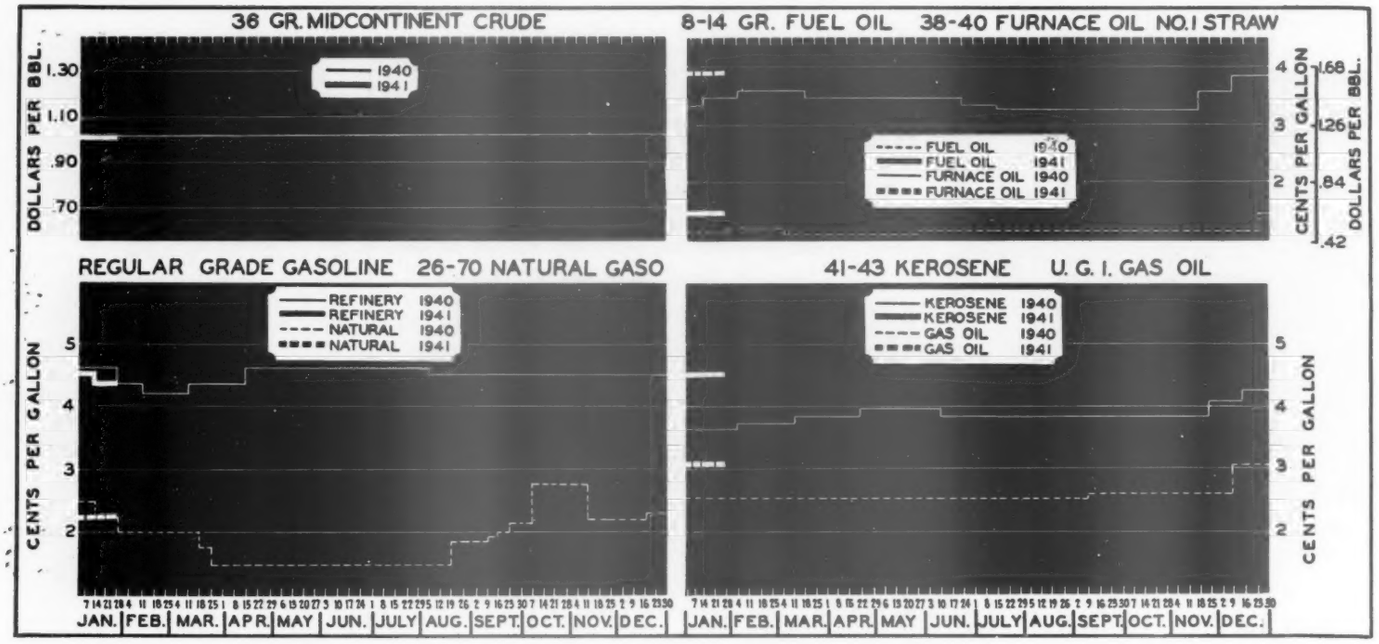
R. C. STONER, has been elected a vice president of the Standard Oil Co. of California, filling the vacancy created by the retirement of M. E. LOMBARDI. Mr. Stoner, joined the Standard Oil Co. in 1913. In 1925 he became assistant general manager of the producing department and was made general manager in 1931. He was elected to the board on January 7, 1938.

CAPT. POWELL A. CASEY, legal department, Standard Oil Co. of Louisiana, Shreveport, has been called to active duty in the U. S. Army at Camp Shelby, Miss.

GEORGE W. PRYOR, Department of Conservation, State of Louisiana, will discuss the Shreveport field, with special reference to the value of well spacing, before members of the Ark-La-Tex chapter, A.P.I., at Shreveport, January 31.

JED B. MAEBIUS, of Saginaw, Mich., geologist for Gulf Refining Co., has been elected president of the Michigan Geological Society, succeeding W. A. CLARK of Mount Pleasant. LEE C. LAMAR, of Carter Oil Co., Saginaw, suceeds WILLIAM F. BROWN, of Mount Pleasant, as vice president.

R. W. LESLIE, manager of research and development for the Skelly Oil Co., has been away from his offices at El Dorado, Kans., for the past 2 weeks while on special advisory work for the Wasach Oil Co. at Woods Cross, Mont. The latter company operates a refinery at this location and substantial additions are being made to the equipment.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Undertone of Inland Refinery Market Draws Strength From Intangibles

By H. STANLEY NORMAN

FUNDAMENTAL aspects of the Mid-Continent refinery market are improving despite absence of tangible supporting evidence. Strength of the market undertone springs basically from a relatively tight crude situation, heavy movement of gasoline and the forecasts of an overall increase of 8 per cent in demand which are already giving promise of fulfillment.

Reaction has not developed from the reduction in refinery gasoline prices 2 weeks ago that would have been normal in previous years. The reduction was less an effort to correct immediate conditions than for the purpose of counteracting competition from condensate producers over a long term. Furthermore, the Gulf Coast and Mid-Continent refinery markets are more intimately linked now than at any previous time in the history of the industry. This intimacy may tie interior and coastal product markets together until export barriers are lifted.

Coast Supplies Back Up

Between 23,000 and 25,000 bbl. of motor fuel daily are backing up from the Gulf Coast through the Mississippi River and fanning out from distribution centers to scores of consuming points previously drawing supplies exclusively from inland refineries. Under normal conditions the motor fuel moving inland from the Gulf would go toward supplying export demand. Adjustments forced by resistance of foreign trade have registered influence on markets throughout the country but particularly east of the Rocky Mountains. The margins on either side of the Mississippi reachable by Gulf suppliers, if they maintain regard for economics, are somewhat limited. The inexpensive water transportation available in landing supplies at river terminals, however, poses a competitive problem for interior refiners. Considering that part of the competitive motor fuel moving inland by the Mississippi system is condensate produced at a cost below refinery gasoline, the problem of holding middle-western markets becomes doubly perplexing to Mid-Continent suppliers.

Improvement in the tank-car price for Mid-Continent grades of lubricating oil is in prospect. The January 27 advance in Pennsylvania crude prices, the third increment of 15 cents since November 12, indicates that lubricating-oil markets throughout the country are in position to move higher. Movement of lubricants from Group 3 refineries have been at a relatively high rate for several weeks but there has been no change in tank-car prices since the latter part of August.

Pennsylvania refiners are reported to have increased their tank-car prices on bright stocks 1½ to 3½ cents per gallon over the past 2 weeks. These advances do not apply to all movement since there are a few suppliers still wrestling with burdensome stocks. The Pennsylvania crude-price advance does, however, indicate that refiners are taking steps to secure supplies of raw material in relation to the volume of contract business booked ahead. Lubricating-oil contracts are mostly based on requirements over the next 4 to 6 months. Strength of the base crude market may, therefore, presage the demand from defense industries.

The Group 3 refinery market may be considered in relatively sound position except for gasoline. Motor-fuel prices are unchanged at a low of 3½ to 3⅝ cents for low-octane material and scaling up to 4½ cents on the high side of quotations on 400-end-point, 72-74-octane material.

Light Fuels Strong

Kerosene, range oil and other grades of distillate fuel oil are commanding premiums and the search for material by middle-western buyers appears to be gaining in intensity. Most suppliers of No. 2 distillate fuel are quoting 3¾ cents per gallon on spot inquiries. Range oil and kerosene are generally held at a spread of 4⅛ to 4⅜ cents per gallon.

The weak market for distillate fuels prevailing in the North Atlantic seaboard territory appears counter to conditions prevailing in the middle-western section.

Vigor of residual fuel oil is another feature of middle-western markets which does not seem to be common with conditions on the Atlantic, Gulf and Pacific coasts. Railroads, steel mills and other industries feeling the first impact of defense manufacturing are the most active in searching for additional heavy-fuel-oil supplies. Most of the Mid-Continent residual is under contract.

Refined Oil Market Barometer

Primary refinery markets are steady and unchanged. Distillate fuel oil on the secondary Atlantic Coast market is down 0.15 to 0.2 cent per gallon yielding to the pressure of high stocks in the Northeast and temperature that has been moderate in relation to last winter. Tanker rates for coastwise movement are trending lower.

MID-CONTINENT: Gasoline is unsettled by competition from condensate moving to interior markets.

GULF COAST: Basic conditions have been improved by coastwise business placed earlier in January.

CALIFORNIA: All grades of fuel oil in higher demand at unchanged prices.

PENNSYLVANIA: Lubricating-oil prices stiffening. Gasoline demand firm.

CHICAGO: Fuel-oil consumers active in searching market for supplies to augment contracts.

Weakness of Light-Fuel Prices Spreads Along Atlantic Coast

By J. P. O'DONNELL

NEW YORK, Jan. 28.—Large supplies of heating oil and the continued softness of the coastwise tanker rates have combined to weaken the East Coast market for No. 2 fuel oil and kerosene. There is a possibility that current prices for these products may face a general reduction in the near future. Some shading of prices has been reported but so far has not become widespread and existing quotations are fairly well maintained.

One of the factors contributing to the large supply of fuel oil available to the East Coast market is the increase in imports which have averaged well over 100,000 bbl. per day at East Coast ports since the beginning of the year. As a result of the large imports, demand at the Gulf Coast is less than it would be otherwise and substantial quantities are said to have moved out of Gulf ports at prices as much as ⅛ cent under the generally quoted 3⅛-cents-per-gallon price.

Minimum prices on No. 2 fuel oil are now 4.7 cents and on kerosene 5.3 cents, off 0.2 cent from the highs that were in effect at the beginning of the year. Shading of these prices, reported on a limited scale last week, indicates the possibility of a further recession from the January 1 levels. Demand for light heating oil this season has been greater than ever but the increase in demand has been insufficient to offset the gain in supplies. Storage reductions in the first 3 weeks of January when demand should be at its peak have averaged less than 12,000 bbl. per day, far less than normal in the peak-consumption season. Light-fuel-oil stocks on the East Coast, including kerosene, diesel fuel and gas oil, are at the highest point in history for the corresponding season.

There were widespread reductions in fuel-oil and kerosene tank-wagon quotations throughout the northeastern district last week. Kerosene tank-wagon prices were reduced from 0.15 cent per gallon in Maryland to 0.2 cent in New Jersey and as much as 0.4 cent in Boston, Mass., and Hartford, Conn. Fuel-oil prices were reduced 0.2 cent throughout New Jersey and Virginia following similar reductions in the metropolitan New York area. Tank-wagon fuel-oil prices in New Jersey now range from 7.5 to 7.9 cents for No. 1 and 6.5 to 6.7 cents for No. 2 and No. 3 grades, while kerosene is quoted at 7.9 cents following its 0.2-cent reduction.

A number of tankers were reported chartered last week for coastwise service at varying rates. Two clean boats were reported chartered on the basis of 55 cents for gasoline, 57 cents for kerosene and 60 cents for No. 2 fuel oil, but another was reported chartered for 50 cents for gasoline, 52 cents for kerosene and 55 cents for No. 2 fuel oil, all for February loading. The variation in rates is an indication of the unsettled condition that is currently characteristic of the tanker market. However, these rates are from 20 to 25 cents below last December highs.

Apparently an increasing number of clean bottoms have become available but the dirty market is reported tight. One dirty tanker was chartered last week for crude oil at rates ranging from 59 to 66 cents per barrel depending on the gravity of the oil. This disparity between clean and dirty rates is unusual, particularly at this time of the year when clean boats for kerosene and fuel oil are normally in heavy demand.

The motor-fuel market in the northeastern area is still showing surprising contraseasonal strength. Some observers are anticipating a much better market in 1941 than was experienced last year. Much of this optimism is based on the low stocks and on the fact that additions to storage in recent weeks have been below normal. One large marketer advanced terminal tank-car quotations for branded gasoline from 0.2 cent to 0.6 cent throughout a large part of the New York-New England territory last week. Advances of 0.6 cent at Portland and 0.3 cent at Boston and Providence, previously the weakest points in the territory, were significant.

Gasoline prices in the New York Harbor area remained steady at from 5.5 to 5.75 cents for 72-octane material. Providence at 5.35 cents and Boston at 5.45 cents per gallon were the lowest along the seaboard with Baltimore and Philadelphia quotations matching the New York Harbor low and those of more southern points ranging from 6.25 to 6.50 cents.

Diesel oil was reduced 5 cents a barrel last week, bringing the price down to $1.95. The reduction affected all North Atlantic ports where current quotations are the same. The lower prices that have been in effect at the South Atlantic ports remain unchanged. The decline in diesel prices was attributed to the same causes as the weakness in fuel oil and kerosene — excess supplies. Demand has been reported satisfactory. While Bunker C fuel oil continues to be quoted at $1.25 per barrel, small quantities of No. 6 fuel oil are reported to be moving at 3.25 cents per gallon in small lots, off from previous lows.

Retail markets are mixed with motor fuel showing an improvement, but fuel oil reveals signs of weakness. Some tank-wagon deliveries were reported in the metropolitan area at less than 6 cents per gallon.

Gulf Gasoline Market Holds Gains Despite Dull Trading

HOUSTON, Tex., Jan. 28.—Gulf Coast refinery gasoline markets continue to hold gains made during the brief buying activity several weeks ago despite the absence of any new important demand. There was growing feeling that bullish developments might be expected in the near future. Some observers believe the present inactivity might be a temporary lull before a wave of intensive buying in line with the expected increase in demand this year.

Purchases of recycling-plant distillate during the past several weeks have materially cleared up this sore spot with Gulf Coast independent refiners. Prices of distillate have strengthened as a result of the elimination of much of this material, and although condensate products are looked upon as good buys, the competition with refinery gasoline is not so acute as it was several weeks ago. Reduced tanker rates to the East Coast also are adding to the improved feeling existing among Gulf Coast refiners.

Gasoline prices still are unsatisfactory but the firmness being displayed in the face of inactive markets, coupled with the prospects for additional business, is inspiring renewed hopes for improvement. It is felt that the market already has touched bottom.

Inactivity also dominated the remainder of the Gulf Coast refinery market. There were no important price changes, although quotations on burning oil were not considered any too secure. Heavy supplies of No. 2 burning oil are looked upon as dooming any chance of important new buying of this material on the Gulf Coast the remainder of the season, which would darken the outlook

(Continued on Page 239)

A.P.I. Weekly Refinery Statistics

Week Ended January 25, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	18,317,000	9,897,000	14,292,000	544,000
Appalachian	91.0	3,210,000	411,000	471,000	138,000
Ind., Ill., and Ky.	90.2	16,352,000	2,908,000	3,818,000	550,000
Okla., Kans., and Mo.	76.9	7,656,000	2,072,000	1,374,000	284,000
Inland Texas	59.6	2,016,000	1,533,000	441,000	114,000
Texas Gulf	89.2	14,064,000	7,568,000	6,669,000	933,000
Louisiana Gulf	97.6	2,926,000	2,194,000	985,000	133,000
N. Louisiana and Ark.	51.5	529,000	461,000	326,000	47,000
Rocky Mountains	56.0	1,364,000	456,000	167,000	56,000
California	87.3	15,928,000	71,082,000	9,831,000	484,000
Total reported	86.2	92,362,000	98,582,000	38,374,000	3,283,000
Est. unreported	.....	6,400,000	1,715,000	665,000	342,000
*Est. total	.....	88,762,000	100,297,000	39,039,000	3,625,000
*Est. total previous wk.	.....	87,351,000	101,213,000	39,920,000	3,490,000
*Jan. 27, 1940	.....	89,405,000	103,238,000	27,866,000	3,470,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended January 18, 1941	259,934,000 barrels
Week ended January 11, 1941	259,342,000 barrels
Week ended January 20, 1940	237,571,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of January 28, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline—Tank wag.	Dlr.	Incl. tax	Kero. tank wag.
Chicago, Ill.	14.6	12.6	4.5	10.0
Decatur	14.6	13.1	4.5	10.0
Joliet	15.6	14.1	4.5	10.0
Peoria	15.6	13.2	4.5	10.0
Quincy	15.4	13.9	4.5	9.8
Davenport, Ia.	15.6	14.1	4.5	‡10.0
Des Moines	15.4	13.9	4.5	‡9.8
Mason City	15.8	14.3	4.5	‡10.2
Duluth, Minn.	16.4	14.9	4.5	10.8
Mankato	16.0	14.5	4.5	9.5
Minneapolis	16.0	14.2	4.5	10.4
LaCrosse, Wis.	17.0	15.5	5.5	10.4
Green Bay	17.4	15.9	5.5	10.8
Milwaukee	16.8	15.3	5.5	10.2
Detroit, Mich.	14.1	12.6	4.5	8.1
Grand Rapids	14.3	12.8	4.5	9.1
Saginaw	14.9	13.4	4.5	9.1
Evansville, Ind.	16.6	15.1	5.5	†9.8
Indianapolis	16.8	14.8	5.5	†10.0
South Bend	16.8	15.3	5.5	†10.0
Fargo, N. D.	18.2	16.7	5.5	11.6
Huron, S. D.	17.5	16.0	5.5	10.9
Kans. City, Mo.*	14.9	11.9	4.5	8.6
St. Louis*	14.7	13.2	4.5	9.6
St. Joseph	14.9	13.0	4.5	8.4
Wichita, Kans.	13.8	12.3	4.5	7.2

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-790 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline—Cons'r tank wag.	Dl-vided dlr.	Incl. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline—Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
Atlantic City	11.00	12.60	4.5	7.9
Newark	11.00	12.60	4.5	7.9
Annapolis, Md.	12.85	14.35	5.5	9.5
Baltimore	12.25	13.75	5.5	8.60
Cumberland	13.65	15.15	5.5	10.0
Washington, D.C.	10.50	12.00	3.5	9.5
Danville, Va.	14.45	16.95	6.5	9.0
Norfolk	13.25	15.75	6.5	10.5
Petersburg	13.55	16.05	6.5	11.2
Richmond	13.55	16.05	6.5	11.0
Roanoke	14.75	17.25	6.5	11.0
Charles'n, W. Va.	14.05	16.55	6.5	11.5
Parkersburg	13.35	15.85	6.5	11.2
Wheeling	14.35	16.85	6.5	11.8
Charlotte, N. C.	16.40	15.00	7.5	10.55
Hickory	16.95	18.45	7.5	9.75
Mt. Airy	16.80	16.00	7.5	10.95
Raleigh	16.15	16.00	7.5	10.25
Salisbury	16.45	14.50	7.5	10.65
Charleston, S. C.	14.25	16.75	7.5	9.25
Columbia	15.10	17.60	7.5	(*)
Spartanburg	15.80	18.30	7.5	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline—Cons'r tank wag.	Net dlr.	Incl. tax	Kero. tank wag.
Atlanta, Ga.	15.0	15.0	7.5	9.0
Augusta	15.5	15.5	7.5	9.5
Macon	15.0	15.0	7.5	9.0
Savannah	15.5	15.5	7.5	9.0
Birmingham, Ala.	16.5	16.5	8.5	8.0
Mobile	15.5	15.5	9.5	8.0
Montgomery	18.0	18.0	9.5	10.0
Jackson, Miss.	15.0	15.0	7.5	9.0
Vicksburg	15.5	15.5	7.5	8.5
Jacksonville, Fla.	16.0	16.0	8.5	8.0
Miami	16.0	16.0	8.5	8.0
Pensacola	17.0	17.0	9.5	8.0
Tampa	16.0	16.0	8.5	8.0
Lexington, Ky.	15.5	15.5	6.5	9.0
Covington	13.5	13.5	6.5	9.0
Louisville	15.0	15.0	6.5	8.5
Paducah	13.5	13.5	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline—Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
Philadelphia, Pa.	12.5	13.5	5.5	10.0
Pittsburgh	13.0	15.0	5.5	10.5
Allentown	13.0	14.5	5.5	10.5
Erie	12.5	15.0	5.5	10.0
*Scranton	13.0	14.5	5.5	10.5
Altoona	13.0	15.0	5.5	10.5
Dover, Del.		14.0	5.5	10.5
Wilmington		13.5	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline—Tank truck	Serv. sta.	Incl. tax	Kero. tank wag.
San Francisco	16.5	17.5	4.5	11.5
Los Angeles	16.0	17.0	4.5	10.0
Fresno, Calif.	17.5	18.5	4.5	12.5
Phoenix, Ariz.	20.5	21.5	6.5	*17.5
Reno, Nev.	19.5	20.5	5.5	13.5
Portland, Ore.	19.0	20.0	6.5	13.5
Seattle, Wash.	19.0	20.0	6.5	13.5
Spokane	20.5	21.5	6.5	16.5
Tacoma	19.0	20.0	6.5	13.5

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline—Cons'r tank car	Dlr.* tank wag.	Incl. tax	Kero. tank wag.
Albany	11.8	12.0	5.5	7.8
Met. New York	12.3	12.5	5.5	8.0
Buffalo	13.0	13.5	5.5	8.1
Rochester	13.2	13.7	5.5	8.6
Syracuse	12.5	10.7	5.5	8.8
Portland, Me.	12.0	11.7	5.5	8.0
Manchester, N.H.	13.2	12.1	5.5	8.9
Burlington, Vt.	11.8	12.0	5.5	8.3
Boston, Mass.	10.7	10.7	4.5	8.0
Worcester	11.3	11.5	4.5	8.0
Hartford, Conn.	11.3	11.5	4.5	7.5
New Haven	11.1	11.3	4.5	7.7
Providence, R. I.	10.7	11.7	4.5	8.0

*Undivided.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline—Tank wag.	Incl. tax	Kero. tank wag.
Denver, Colo.	14.5	5.5	10.5
Grand Junction	16.5	5.5	12.0
Pueblo	15.5	5.5	9.0
Casper, Wyo.	16.5	5.5	11.5
Cheyenne	12.0	5.5	11.0
Billings, Mont.	16.5	6.5	12.0
Butte	15.5	6.5	13.0
Great Falls	15.5	6.5	12.0
Helena	15.5	6.5	12.5
Salt Lake, Utah	16.0	5.5	14.0
Boise, Idaho	†18.6	6.5	16.0
Twin Falls	†19.6	6.5	16.5
Albu'que, N. M.	*16.0	7.0	9.5
Roswell	*14.0	7.0	8.0
Santa Fe	‡17.0	7.5	9.5

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline—Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
New Orleans, La.	14.25	16.75	8.5	‡10.0
Baton Rouge	14.75	17.25	8.5	‡10.5
Alexandria	14.75	17.25	8.5	‡10.5
Lafayette	15.00	17.50	8.5	‡10.0
Lake Charles	14.75	17.25	8.5	‡10.0
Shreveport	14.00	16.50	8.5	10.0
Knoxville, Tenn.	18.00	20.00	8.5	12.5
Memphis	16.00	18.00	8.5	11.0
Chattanooga	17.50	17.35	8.5	12.0
Nashville	17.00	17.50	8.5	11.0
Bristol	18.25	18.75	8.5	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline—Tank wag.	Incl. tax	Kero. tank wag.
Texarkana, Ark.	13.5	5.5	6.0
Fort Smith	13.5	5.5	6.5
Little Rock	16.0	8.0	8.0
Muskogee, Okla.	13.5	5.5	7.0
Oklahoma City	12.5	5.5	6.5
Tulsa	12.5	5.5	6.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline—Tank wag.	Dlr.	Incl. tax	Kero. tank wag.
Omaha	17.4	15.9	6.5	9.8
McCook	17.0	13.9	6.5	9.5
Norfolk	17.5	15.4	6.5	9.9
North Platte	17.8	15.5	6.5	10.2
Scottsbluff	17.4	14.5	6.5	10.8

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline—Tank wag.	Dlr.	Incl. tax	Kero. tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.5
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Tank-Wagon Changes

Socony-Vacuum Oil Co., Inc., advanced tank-car and undivided-dealer gasoline prices 0.4 cent per gallon January 23 at Rochester, N. Y.; raised tank-car prices at Portland, Me., 0.6 cent and reduced tank wagon 1.1 cents; advanced tank-car price at Manchester, N. H., 0.4 cent; raised tank-car and tank-wagon prices at Burlington Vt., 0.2 cent; advanced the tank-car price at Boston and Worcester, Mass., 0.3 cent; advanced Providence, R. I., tank-car prices 0.3 cent and tank-wagon postings 0.2 cent.

Socony-Vacuum reduced kerosene tank-wagon prices at New York 0.3 cent per gallon January 18; reduced kerosene at Albany, N. Y., 0.2 cent January 21; advanced kerosene at Buffalo, N. Y., 0.2 cent January 22 and raised 0.1 cent at Rochester, N. Y., January 21. Tank-wagon price of kerosene was reduced 0.1 cent January 21 at Syracuse; 0.4 cent at Portland, Me.; 0.3 cent at Manchester, N. H., and Burlington, Vt. The kerosene tank-wagon price was reduced 0.4 cent January 21 at Boston, Mass., Hartford, Conn., and Providence, R. I. Kerosene was advanced 0.3 cent January 21 at New Haven, Conn.

Standard Oil Co. of New Jersey reduced the kerosene tank-wagon price at Baltimore 0.15 cent January 20 and on January 21 reduced the price 1.1 cent per gallon at Charleston, W. Va. The company reduced kerosene tank-wagon prices 0.2 cent per gallon January 20 throughout New Jersey.

Standard Oil Co. of Kentucky reduced the consumer and dealer tank-wagon price of gasoline 0.5 cent per gallon January 1 at Paducah, Ky., and on the same day reduced the price to both classes of trade 1 cent at Jackson, Miss. The company reduced the kerosene tank-wagon price 1 cent per gallon January 14 at Birmingham, Ala.

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of January 28, 1941

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
63-66 octane	.03⅞	.04⅛
60 octane and below	.03⅝	.03¾
60-62 400 grades:		
72-74 octane (regular)	.04⅜	.04½
63-66 octane	.04	.04¼
60 octane and below	.03⅝	.03¾

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
63-66 octane	.03⅞	.04⅛
60 octane and below	.03⅝	.03¾
60-62 400	.03⅝	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
63-66 octane	.03⅞	.04⅛
60 octane and below	.03⅜	.03⅝

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04½
60 octane and below	.03⅝	.03¾

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04⅜	.04⅝
63-66 octane	.04	.04⅜
60 octane and below	.03⅝	.03¾
60-62 400 grades:		
72-74 octane (regular)	.04⅜	.04⅝
63-66 octane	.04	.04¼
60 octane and below	.03⅝	.03¾

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)		.06
72-74 octane		.05¾

CALIFORNIA (domestic movement)—

88-80 400, 65 oct. and higher	.05½	.07¼
84-88 U. S. Motor	.04½	.06¼

EAST COAST (domestic)—

U. S. Motor grades:		
New York (Bayonne)*	.05	.05¾
Philadelphia	.05½	.06½
Boston	.05½	.05⅞
Baltimore	.05½	.06¾
Charleston, S. C.	.05½	.06½

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
72-74 octane (leaded)	.03¾	.03⅞
70-72 octane (unleaded)	.03¾	.04
68-70 octane (unleaded)	.03½	.03¾
Below 68 octane (unleaded)	.03¼	.03½

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02¾
Grade 18-55	.02¾	.02⅞

NORTH TEXAS—

Grade 26-70		.02
Grade 18-55		.02⅝

CALIFORNIA—

75-85 375-390	.04½	.05⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.02

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p.	.03½	.03⅝
41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03¾
46-48 gr., 210-230 i.b.p., 480-max., e.p.	.03⅞	.04

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.04⅛	.04⅜
41-43	.04⅛	.04¼

NORTH TEXAS—

41-43	.04	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04	.04⅛

ARKANSAS (Ark. and N. La. del.)—

41-43	.04	.04¼

PENNSYLVANIA (inland refineries)—

46	.05⅛	.05⅜
45	.05⅛	.05¼

CHICAGO (Based on Group 3)—

42-44	.04¼	.04⅜
41-43	.04⅛	.04¼

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04½	.05½

NEW YORK (Bayonne, N. J.)—

41-43	.053	.055

GULF COAST (domestic)*—

41-43	.03½	.03⅝

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.04	.04⅛
No. 1 prime white, 38-42	.03⅞	.04
No. 1 straw, 38-40	.03⅞	.04
No. 2 straw, 32-36	.03½	.03¾
No. 3 zero to 10, 28-32	.03⅜	.03½

NORTH TEXAS—

No. 1 prime white, 38-42	.03¾	.03⅞
No. 1 straw, 38-40	.03⅜	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03½	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.03½	.03⅝

CHICAGO (Based on Group 3)—

Range oil	.04	.04⅛
No. 1 prime white, 38-42	.03⅞	.04
No. 2 straw, 32-36	.03½	.03¾
No. 3 zero to 15, 28-32	.03⅜	.03⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.053	.055
*No. 2	.047	.049
*No. 4	.047	.049

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.03⅛	.03¼
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.60	.65

NORTH TEXAS—

U.G.I. gas oil, under 35	.03	.03⅛
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.60	.65

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial		.70

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.03⅛	.03¼
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 8-14	.60	.65

PENNSYLVANIA (inland refineries)—

36-40	.04½	.05

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.75
10-17 (high sulfur)	.50	.65
San Joaquin Valley:		
10-18 (tank cars)	.55	.70
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.75	.80

GULF COAST—

No. 2 fuel	.03⅛	.03¼
43-47 diesel	.03⅛	.03¼
48-52 diesel	.03⅛	.03⅝
53-57 diesel	.03½	.03⅞
58-and-above diesel	.03⅝	.03¾
Diesel bunkers		1.50
Bunker C (bulk cargoes)	.75	.80
Bunker C (bunkers)		.80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04⅞
28-30 diesel (lighterage 6¼c per bbl.)		1.95
28-30 diesel (tank cars)	.047	.049
Bunker C (to ocean-going ships in N. Y. Harbor)		1.25
Industrial fuel (tank cars)		.03½

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.18
150-160 D, 0-10		.13½
150-160 D, 10-25		.13
100-110 D, 0-10		.13
100-110 D, 10-25		.12½
Steam refined:		
600 dark green (untreated)		.07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.16
15 pour point		.15
25 pour point		.14
Steam refined:		
600		.08
650	.08	.08½
600 flash	.09	.09½
630 flash	.11	.12

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.08
180-3		.08½
200-3		.08½
250-3		.10
280-3		.10½
280-4		.10
300-3½		.11
350-3½		.11½
400-3½		.12
500-3½		.12½
600-3½		.13
100-2½ paraffin oil, 10-25		.05¼
10-25 pour point:		
200-3		.08
250-3		.09½
280-3		.10
280-4		.09½

GULF COAST—

Pale oils:		
100-3	.05⅛	.05¼
200-3	.07⅛	.07¼
300-3	.07½	.07⅝
500-3½	.08¼	.08½
750-3½	.08⅝	.08⅞
1,200-3½	.08¾	.08⅞
2,000-4		.09
3,000-4		.10½
Red oils:		
200-5-6	.06⅞	.07
300-5-6	.07¼	.07½
500-5-6	.08	.08¼
750	.08⅝	.08½
1,200-5-6	.08½	.08⅝

CALIFORNIA (moving to dom. market)

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis., at 70° F., 3 color, 400-405 flash:		
Zero pour point		.22½
10 pour point		.21½
15 pour point		.20½
25 pour point		.19
200 vis., at 70° F., 3 color:		
Zero pour point		.24½
10 pour point		.23½
15 pour point		.22½
25 pour point		.21

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.02½	.02¾

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale		.02¾
124-126 (A.m.p.) w.c. scale		.02¾

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax		.0560
128-130 (A.m.p.) wax	.0560	.0570
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.		.02¾
124-126 (A.m.p.) y.s.		.02¾
Petrolatum in barrels, carload lots:		
Dark green	.02125	.02625
Amber	.02375	.02875
Extra amber	.02625	.03000
Lily white	.04375	.05125
Snow white	.05125	.06000
Cream	.03375	.04125

Export Prices

GASOLINE

GULF COAST—

60-62 400	.03¼	.04
61-63 390	.03¼	.04
64-66 375	.03¼	.04

LOS ANGELES—

U. S. Motor grades:		
Above 69 octane	.05½	.05¾
65-69 octane	.05¼	.05½
60-65 octane	.04½	.05

KEROSENE

GULF COAST—

41-43 water white	.03½	.03¾

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (i.a.s. in bbl.)—

Cylinder stocks:		
600 S.R. unfiltered		.17
630 S.R. unfiltered		.17½
600 flash, S.R.		.18
650 flash, S.R.		.20
Bright stock:		
Light, 25 pour point	.20½	.21

NEUTRAL OIL

200-3 color		.27
150-3 color		.25½

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p.		.0560
125-127 A.m.p.		.0560
128-130 A.m.p.		.0585
133-135 A.m.p.		.0615
135-137 A.m.p.		.0640
Crude scale:		
124-126 w.s.	.02⅝	.02⅞
124-126 y.s.	.02⅝	.02⅞

EQUIPMENT PROGRESS...

Light-Type Center-Latch Elevator Offered by BJ

Byron Jackson Co. announces the development of a light Type A center-latch drill-pipe elevator for handling collar-type drill pipe and tubing where the working load does not exceed 60 tons. The body of this elevator is made of special-analysis steel, fully heat-treated to withstand the pounding effect of hardened tool joints with a minimum of upsetting. The body

is made in two halves of practically the same weight, which insures proper balance, and easy opening and closing. The width of the body below the trunnions is held at a minimum to allow more room for the links, prevent binding and to permit the lift to be exerted directly under the tool joint or tubing collar with no undue stress on the elevator trunnions.

The operating handles have an underhanging knob at the outer end which provides a safe, easy grip. Stop guards placed toward the rear of the handles prevent the operator from crushing his hands between the handles and links. The elevator is locked by a patented T-head spring latch which fits into a recess in the body where it cannot accidentally be knocked open when "tailing out." The outer end of the latch is curved as a convenient hand hold when opening the elevator.

The BJ light type-A elevator comes equipped with curved link blocks, of new design, which allow free movement of the elevator links when the elevator is being opened or closed. The new-type link blocks are hinged at the top, close downwardly, and are securely bolted in place. This design makes a C-link effect when the link blocks are closed, increasing the strength of the elevator trunnions. Thorough lubrication of the elevator is effected through a standard grease-gun connection in the rear of the elevator.

Complete information about the BJ light Type A center-latch elevator may be secured from Byron Jackson Co., Box 2017 Terminal Annex, Los Angeles, Calif.

TRADE LITERATURE

CARBIDE & CARBON CHEMICALS CORP., 30 East Forty-second Street, New York.—96-page book, "Synthetic Organic Chemicals," containing data on properties and uses of 142 industrial organic chemicals. This book is a completely revised and enlarged tenth edition, including six new chapters, and contains information on 66 products not described in any previous editions. Each synthetic organic chemical is classified and described in accordance with the characteristic group to which it belongs. An index of the industrial applications of the 142 synthetic organic chemicals is particularly useful in locating references to one's own industry. More than 45 tables have been compiled containing such useful information as resin solubilities and arrangements of the chemicals in the order of their physical properties such as boiling point, specific gravity, viscosity, etc., greatly simplifying the task of finding a compound with the desired combination of properties. Tabulations containing shipping information and specifications make the book as helpful to a purchasing agent as it is to the chemist.

KEUFFEL & ESSER CO., Hoboken, N. J.—"How to Choose a Slide Rule," 24 pages, 26 illustrations, two colors. This humorous publication explains for the first time the difference between the various types of slide rules available, in straightforward, salty language. Although written primarily for students in engineering colleges, this booklet contains slide-rule information of interest to the entire engineering profession.

AIR REDUCTION SALES CO., 60 East Forty-second Street, New York.—A comprehensive course of exercises covering the oxyacetylene welding process for the aviation industry. The purpose of this course is to provide a well-planned series of exercises (67) to illustrate all the varied conditions existing in the art of aircraft welding. It can be utilized also to train operators who have had experience in other lines of oxyacetylene welding. Price is 50 cents per copy.

New Wiper Developed for Oil Lines by Patterson-Ballagh

An effective wire-line wiper, somewhat similar in design to the Patterson-Ballagh wire-line guide, has been developed by Patterson-Ballagh Corp. Known as Style B, this wire-line wiper is developed especially for service on producing wells where gas and high-gravity oil are encountered.

It comprises a steel housing and an easily replaceable one-piece rubber refill. This housing is a hinged steel casting, held together with a quick-acting butterfly nut and hinged bolt, and equipped with hold-down chains. Wiping is done with a one-piece, spirally wound, replaceable rubber refill. Details regarding the wire-line wiper, Style B, may be obtained from the manufacturer, Patterson-Ballagh Corp., 1900 East Sixty-fifth Street, Los Angeles, Calif.

Lane-Wells Offers Radioactivity Well Logging in Gulf Fields

Radioactivity well-logging service will be available to oil-well operators from the Houston, Tex., office of the Lane-Wells Co., according to an announcement made by M. E. Montrose, general sales manager.

Lane-Wells radioactivity well logging is an advanced method of determining bore-hole formation characteristics in both cased and uncased holes. Formations are reliably logged through as many as three strings of cemented casing. Results are not influenced by the fluid content of the bore hole, and radioactivity logs made in open hole with very salty mud, or with oil-base drilling fluid, have full details and are easily correlated with logs made in cased wells.

DOWELL, INC., HOLDS ANNUAL SALES AND ENGINEERING CONFERENCE AT TULSA

At Tulsa last week field managers and salesmen of Dowell, Inc., met with the company's executives, board of directors and the general office, sales and research staffs in an annual engineering and sales conference. The meeting, which was primarily devoted to discussions of new developments in the field of acidizing, was attended by some 90 members of the Dowell organization. Over 70 wives of the field men accompanied their husbands to the Tulsa meeting to engage in social activities conducted along with the conference. Those attending the conference are shown in the above photograph.

Pull-Rod Break-Repair Time Cut By Use of Simplex Jacks

The new No. 440 Simplex deep-well pull-rod jack made a good name for itself in 1940 and upheld the fine reputation of Simplex oil-field jacks made by

Templeton, Kenly & Co., Chicago. The Simplex No. 434 shallow-well jack has long been known among oil men for the time it saves in repairing broken pull rods. These same savings were made available to deep-well producers with the introduction of the No. 440.

One man can put on and take off this jack. It has a "speed crank" for quickly taking up the slack and a lever for bringing the broken rod ends together so they can be joined with a "turtle back." The gear mechanism is enclosed to protect it against dirt. The rack bar travels 22 in. with each hold, and the taken-up rod can be held while rack bar is run out to get a fresh hold for additional take-up. Capacity is 7 tons—enough to pull rods on deep wells.

Clarence L. Boyd Co., Inc., Purchases Lewis Brothers Co.

W. R. Borgman, president of the Clarence L. Boyd Co. of Guthrie and Oklahoma City, Okla., announced the purchase of Lewis Brothers Co. of Tulsa this week. In addition to the regular line of road-building equipment, the company will be distributors for International tractors, International power units, Bucyrus-Erie equipment, J. D. Adams road machinery, pipeline equipment, Trackson pipe layers, and Jacobs cathodic units.

The Tulsa warehouses and offices will be maintained at Third and Frankfort in the former Lewis company location. Heading the Tulsa office will be W. R. Borgman, president and Wayne Hood, C. M. Mullins, B. K. Cooper, John Gilkerson, Bo Bardsley and Doc White. The Clarence L. Boyd Co., Inc., is well known throughout the Southwest, having been in the equipment business for the past 27 years.

AMONG EQUIPMENT MEN

George N. Jeppson Elected President of Norton Co.

George N. Jeppson has been elected president of Norton Co., succeeding Aldus C. Higgins who resigned to become chairman of the board, a position vacant since the death last year of Charles L. Allen. Mr. Jeppson has been vice president and treasurer.

Mr. Jeppson entered the employ of Norton Co. in 1892. After being assistant superintendent and works manager, he was chosen a director in 1906. In 1919 he was made secretary, and in 1933 became treasurer. He has been a vice president several years.

Mr. Higgins became identified with Norton in 1900. He managed the abrasive plants before he was elected secretary in 1912, and treasurer and general counsel in 1919. He has been president since 1933.

The following were reelected officers of the company: Harry K. Clark, vice president and general manager; Andrew B. Holmstrom, vice president in charge of production; Herbert A. Stanton, vice president and foreign manager; Howard W. Dunbar, vice president and manager of machine division; W. LaCoste Neilson, vice president, and Lewis E. Saunders, vice president. Henry Duckworth, retiring assistant treasurer, was elected vice president.

Mr. Neilson, previously in charge of foreign affairs, Mr. Saunders, previously in charge of research and abrasive plants, and Mr. Duckworth, previously in the treasury department, will be consultants in their respective fields. Clifford S. Anderson was reelected secretary, clerk and general counsel. Malcolm N. Pilsworth was elected assistant secretary and reelected assistant counsel. Milton P. Higgins, previously assistant manager of research and abrasive plants, was elected treasurer, and William J. Magee, previously controller, was elected assistant treasurer in place of Mr. Duckworth.

BUSINESS NOTES

John A. Gillan of National Geophysical Co. has succeeded W. H. Salvatori as president of that company upon the latter's retirement January 1, 1940. In the January 9 issue on these pages it was incorrectly reported that he succeeded Henry Salvatori, who is president of the Western Geophysical Co., Los Angeles, Calif., and is in no way connected with the National Geophysical Co.

A. R. Weis, president of the Pacific Pump Works announces the appointment of Wendell R. Carlsen as sales manager of the centrifugal pump department for the Mid-Continent division, effective January 15, 1941. Mr. Carlsen will assist the agents already established in the Mid-Continent and will handle both sales and service for the entire territory with offices in the Commerce Building at Houston, Tex.

J. B. Kissinger, auditor of Oil Well Supply Co.'s California division, retired on December 31 after 15 years of service with "Oilwell." Mr. Kissinger started with the company at Oil City, Pa., in 1895. Since 1909 he has been connected with "Oilwell's" Pacific Coast activities, headquartering in Los Angeles.

E. B. Fowks Elected President Of Los Angeles Nomads

New officers for the year 1941 were elected at the annual business meeting of the Los Angeles chapter of Nomads held in Los Angeles, Calif., on Wednesday evening, January 15. The officers selected for the year were: E. B. Fowks, Emsco Derrick & Equipment Co., president; W. F. Bettis, M. O. Johnston Oil Field Service Corp., vice president; Earl M. Rees, Oil Well Manufacturing Co., secretary-treasurer; Elmer R. Smith, Lane-Wells Co., assistant secretary-treasurer; R. J. Eiche, sergeant-at-arms; and Roy Hitchcock, H. & B. Sales Co., deputy sergeant-at-arms.

E. B. FOWKS

Following the usual dinner Nomad R. P. Smith, National Supply Co., gave a talk on conditions in England and Rumania during the past decade from information gained on numerous visits to those countries prior to the present war.

Among the other guests from foreign fields were: C. H. Fewell of Burmah Oil Co., David Dimitt of International Petroleum from Peru, J. C. Devine of Petroleum Concessions, Qatar-Oman, J. J. Cardynaals of B.P.M.; P. M. Bowen, formerly with the C.P.C. in Maracaibo, Venezuela; C. R. McGee of Solupema Petroleum, Ltd., operating south of Bahia, Brazil; and C. H. Goff of U.B.O.T. from Trinidad.

Arrangements for the second annual inaugural ball of the Los Angeles Chapter of Nomads have been announced. This big social event of the Nomads will be held at the Wilshire Country Club in Los Angeles on Valentine's Day, February 14. The committee in charge of the inaugural ball consists of Bob Eiche, chairman; Bill Bettis, of M. O. Johnston Oil Field Service Co.; Elmer Smith, of Lane-Wells Co.; Jack Walton; George Trembly, of Howard Supply Co.; Fred Ripley, of Emsco Derrick & Equipment Co.; Elmer Decker, of Martin-Decker Corp.; Larry Coker, of National Supply Co.; and Frosty Martin, of Martin-Decker Corp.

FRANK CHAMPION HEADS HOUSTON NOMADS CHAPTER

Frank Champion, Byron Jackson Co., was elected president of the Houston chapter of the Nomads at their annual business meeting and dinner-dance January 22. He succeeds Rex G. Hamaker, Reed Roller Bit Co., who was reelected national regent.

Ray L. Dudley, of Gulf Publishing Co., was elected vice president, succeeding Mr. Champion; C. E. Whitney of Baker Oil Tools, Inc., was elected secretary-treasurer, succeeding J. H. McEvoy of McEvoy Co.; Gordon Richmond of Hughes Tool Co., sergeant-at-arms, succeeding Kenneth Craver of Thornhill-Craver Co.; Mr. McEvoy, assistant sergeant-at-arms, succeeding Mr. Richmond; and E. W. Farrow of Security Engineering Co., assistant secretary-treasurer, succeeding Mr. Dudley. Mr. Dudley and Mr. Hamaker were reelected national regents.

Members of the Houston chapter shown in the photograph are: Top row, left to right, Pete Wallace, Link Belt Co.; J. H. McEvoy; Kenneth Craver; Gordon Richmond; Floyd Senter, National Tank Co.; W. A. Davis, Baker Oil Tools, Inc.; E. W. Farrow; E. F. Baldwin, Hughes Tool Co.; C. E. Richards, Gray Tool Co.

Middle row, left to right, Ray L. Dudley; Rex G. Hamaker; J. E. Elliott; A. P. Berry, Lacey Export Co.; H. J. Craig, Baash-Ross Tool Co.; Homer Thornhill, Thornhill-Craver Co.; O. W. Morgan, Byron-Jackson Co.; W. J. Nutto, Reed Roller Bit Co.; Otis Dyer, drilling contractor; C. W. Thornhill, Thornhill-Craver Co.

Bottom row, left to right, Carl Vogt, Shaffer Tool Works; C. E. Whitney; C. W. Wood, Howard Smith Co.; Lester Cain, Portable Rig Co.; Claude Banta, Hydril Co.; O. D. Small, W-K-M Co.; E. J. Robishaw, A1 Bit Co.; Madden Works, Cameron Iron Works.

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LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

NEW MEXICO
STATE OIL AND GAS LEASES
Another block in a NEW HOT SPOT. This is a good bet. Buy direct and save those dollars. No middle man to pay; no salesmen to bother you. Better buy a little of something, than a whole lot of nothing.
HARRY S. WRIGHT
New Mexico State Lessee
Farmington, New Mexico

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, also tracts of proven Fluorspar and zinc deposits. Reports on request. W.P. HARLEY, Bowling Green, Kentucky.

NEW MEXICO
Oil and Gas Leases and Royalties
ROY G. BARTON, Hobbs, N. M.

HOMER L. FITCH, GEOPHYSICIST AND LOCATION ENGINEER
WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

MISSISSIPPI
SALESMEN, BROKERS, Cheap Lands in fee with all mineral rights in well located counties where Major companies have large lease holdings. Write Box 754, Jackson, Mississippi.

WILL take $7500.00 cash for ½ interest in 3000 acres oil leases and drilling well, half completed, good geology, on West Texas Structure, six formations to 3250 ft. depth. Address Owner, 610 Wilson Building, Dallas, Texas.

FOR LEASE—100 acres for oil, 4½ miles east of Post Oak, in Jack County. P. O. Box 291, Holliday, Texas.

FOR lease 9 patented gold claims near Boulder, Colorado. Electric power. Complete equipment for operations. Property in splendid shape. Ready for immediate operation. Address Box A-342, The Oil and Gas Journal, Room 1404, 105 W. Madison St., Chicago, Ill.

FOR SALE or Trade Producing oil and gas lease on 396 acres in Southern Illinois oil fields. Box A-341, Rm. 1404—105 W. Madison, Chicago, Illinois.

BLOCK 1000 acres nearly surrounded by good oil showings. One dollar per acre new 5 year leases, located in Sections 23, 24, 25 and 26. Twp. 23n, R. 4e, Pawnee County.
J. F. HOUSTON, Pawnee, Okla.

FOR SALE—Lease on 80 acres fee land ⅝ mile from production in Cut Bank, Mont., oil field; 2900-foot drilling, sand production, 36-38 gravity "sweet" oil; no proration; good market. Address O. I. DeSchon, Great Falls, Mont.

Leases and Drilling Blocks

LA SALLE COUNTY, TEXAS
Hot Wilcox play. Will give leases (3000 acres) for test. Good geology. Same contours, strike and trend as Cullen-Washburn well, that found five oil sands 3600-5400 feet. Box A-340, The Oil and Gas Journal, Tulsa, Okla.

WANTED—Good men to finance drilling campaign proven leases famous high gravity shallow belt. No advances. Box 448, Cisco, Texas.

EAST TEXAS Woodbine-Trinity sand wildcats starting. Leases afford 10 to 50 for 1 bet. Has already happened past 60 days. E. CROFT, PROCTOR, TEXAS.

INVESTIGATIONS, REPORTS AND MAPS
On producing or nonproducing oil land anywhere in Louisiana. Nominal fee.
Petroleum Service Bureau
606 Gravier St., New Orleans

AUCTION, J. F. CRAIG Estate at Meehan Junction, Miss. (11 miles N.W. of Meridian), Feb. 12th, 10 A.M. 9434 acres valuable oil, gas, mineral and timber lands will be sold in 40 to 740 acre tracts regardless of price, for division among heirs. Terms cash.
JOHNSON LAND CO.
Haas-Howell Building
Atlanta, Georgia.

U. S. OIL RESERVE lands can be filed for lease on limited acreage by American Citizens. Want several join me in filing block in developing Rocky Mountain Area. Big opportunity. Small expense. Box A-346, The Oil and Gas Journal, Tulsa, Okla.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

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ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Iquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

WILL buy small or large producing oil royalty interests in Okla., Texas or New Mexico. Oscar L. Grimes, Tulsa Loan Bldg., Tulsa, Okla.

WILL purchase royalties, on land in Illinois. Must first be given right to test land with my method, which quickly eliminates non-mineral formation. This test is done without charge and free from any obligation on part of owner of land. Not interested in brokers offers. Address Box A-268, The Oil and Gas Journal, Room 1404, 105 W. Madison, Chicago, Illinois.

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THE Gravitational Selector, 14957 Lakewood Heights Boulevard, Lakewood, Ohio, offers to help make this your Lucky Year in producing Oil and Gas. Why not stop guessing? Use this scientific method to locate your structures and wells. Our last three predeterminations are making 120, 200 and 500 barrels respectively in a state where dry holes are the rule. Use our system and you will start the year right and end it a more prosperous man.

Situations Wanted

CHEM. Eng. 10 yrs. experience in oil devel. refining, and operation. Wish to make change. Address Box A-330, The Oil and Gas Journal, Tulsa, Okla.

ACCOUNTANT, office manager, experienced in oil industry. Capable of handling income taxes, social security and wage and hour matters. Box A-332, The Oil and Gas Journal, Tulsa, Oklahoma.

SUCCESSFUL MANUFACTURER'S AGENT calling on Texas refiners and industrial plants wants additional high quality line which requires experienced engineer who has demonstrated sales ability. Box A-345, The Oil and Gas Journal, Tulsa, Okla.

MARRIED man, age 30, B.S. in Physics and Math., desires permanent connection with reliable firm. Five years' varied geophysical experience including field, interpretation, computation, reports. References. Address Box A-344, The Oil and Gas Journal, Tulsa, Okla.

LEASEMEN. Experienced in leasing large blocks Georgia, Florida, and Alabama. Have car, can furnish best of references. Address Kenneth Nix, 343 Peachtree Street, Atlanta, Georgia.

Help Wanted

WELDING Engineer, graduate metallurgist with experience in fabrication procedure and welding practice. State acceptable salary. Battelle Memorial Institute, Columbus, Ohio.

WANTED — Experienced refinery designing draftsman. Permanent. Salary. Box A-343, The Oil and Gas Journal, Tulsa, Okla.

AMERICAN Citizens, wanted three draftsmen, not now engaged in National Defense work, familiar with power plant design and modern piping. Give complete experience record and sample of work. Address: Siems Drake, Puget Sound, Seattle, Washington.

WANTED
SALESMEN
Geophysical Experience Desirable.
GEOLOGICAL SCIENTIFIC SERVICE CO., INC.
Sinclair Building
FORT WORTH, TEXAS

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ROYALTY owners, Oil Investors, Unit holders, Stockholders in Oil and Royalty Companies. Personnel lists of every branch of oil industry. All by States. We buy lists. New catalogues ready. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

Ranches—Farm Lands

FOR SALE: Beautiful Historical California Ranch, 800 A. Semi modern, improved. Live Oaks, springs, etc. Good roads; 26 miles east San Diego. Snap $36,000. 2644 Rimpau Blvd., Los Angeles.

WYOMING CATTLE RANCH 10,000 A. deeded, 15,000 A. leased. Will handle 3000 cows. Cuts 3500 tons hay. Excellent fishing, hunting and scenery. Spacious modern house. Huge barns and sheds. Will sell completely equipped at less than half value with or without 2000 high grade Herefords. Western Realty Company. 400 Livestock Exchange Building, Denver, Colorado.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

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	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
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4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

For Sale—Equipment

FOR SALE: 1—Ideco Portable Standard Rig suitable for drilling, pumping, or servicing, complete less motor. I.T.I.O., Bartlesville, Okla.

FOR SALE

One gasoline drilling rig with two 85 H.P. Waukesha motors and unitized draw works complete.

300 sets 3" A.P.I. tool joints.

10,000 Ft. 7" O.D. 26# seamless casing, once run.

15,000 Ft. 4½" O.D. seamless drill pipe equipped with both regular and full hole tool joints.

In addition to the above we have 20,000 Ft. of 6" screw line pipe in Oklahoma; also drilling rig capable of drilling to 6500 feet, complete stock of line pipe, casing, drilling and pumping equipment.

Wire, Write or Phone for Prices

Louisiana Iron & Supply Co.
Shreveport, La.

FOR SALE — At Oklahoma City — 11 6" and 8" Byron-Jackson built-in motor pump heads for use in operating deep-well turbine pumps. I. T. I. O. Company, Bartlesville, Oklahoma.

FOR SALE

ANY QUANTITY

NEW SEAMLESS STEEL COUPLINGS

750—13" O. D. (12½" Pipe) 8-V Thread x 8¼" long, Line, at $1.35 each.

3000—1¼" Black Merchant Forged Steel, at 4c each.

2500—1½" Black Merchant Forged Steel, at 5½c each.

6000—1¼" Galv. Merchant Forged Steel, at 5¼c each.

RECONDITIONED PIPE

30,000 feet 12", 50 lb. at $1.25 per foot.

80,000 feet 6" Std. at 38c per ft.

All of the above F.O.B. Philadelphia District, subject to prior sale. Pipe in lengths 18'0" and longer, plain ends.

EASTERN PIPE SUPPLY COMPANY
1424 N. NINTH STREET
PHILADELPHIA PENNA.

FOR SALE: At Oklahoma City—1 Toledo electric power drive complete with 60 cycle single phase 110-volt A.C. motor. I. T. I. O. Company, Bartlesville, Oklahoma.

FOR SALE—At Oklahoma City, Oklahoma, 25,000' ⅞" X 30' double pin used sucker rods, 5c per foot. I. T. I. O. Co., Bartlesville, Okla.

FOR SALE: At Bartlesville, Oklahoma, 1—50 HP Kewanee locomotive type boiler with stack 150# WP. Will pass state inspection. $200.00. I. T. I. O., Bartlesville, Okla.

BARGAIN!
Used Drilling Equipment
3500' Capacity Portable Drilling Unit with engine
Model E-5 McNeeley Shale Shaker
Pipe Handling Equipment
Steam Lubricators — Gas Regulators — Burners — Blower Controls.
LUCEY PRODUCTS CORPORATION—Tulsa.

FOR SALE: At Oklahoma City 2—set slightly used 6½" Spang Weldless drilling jars 4½" stroke 3¼"—4¼" box and pin, $100.00 per set. I. T. I. O., Bartlesville, Okla.

FOR SALE: Southern Oklahoma, five 450 HP Gas engines direct connected 36" compressors for boosting plant at sacrifice. Full information, write
EMCO EQUIPMENT CO.
1st Natl. Bldg., Oklahoma City, Okla.

FOR SALE: 4—OCS Roller Bearing Chain Driven Sand Reels. I. T. I. O., Bartlesville, Okla.

NOTICE — CABLE-TOOL CONTRACTORS. Save money; good used wire lines. All sizes up to 5,000 ft. long. See us before you buy. General Tool & Supply Co., P.O. Box 4387, Oklahoma City, Oklahoma.

FOR SALE: At our Oklahoma City warehouse slightly used Cardwell KS DHS skid type oil well servicing unit equipped with DHK Waukesha motor. I. T. I. O. Co., Bartlesville, Okla.

Equipment Wanted

Equipment Wanted

Equipment Wanted

WANTED TO BUY

All Sizes Storage Tanks—Wood or Steel Roof—10,000 bbl. to 80,000 bbl.
Abandoned Plants—Natural Gasoline, Oil Refineries, etc.
Send us lists of your surplus material and equipment

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry and H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

For Sale—Equipment

FOR SALE—At Seminole, Oklahoma—1 8' diameter X 26' gasoline steel storage tank. I. T. I. O. Company, Bartlesville, Oklahoma—$200.00.

USED OIL TRUCKS

Mack—Diesel train—6300 Gallons.
Diamond T—6 wheeler—3000 Gallons.
Diamond T—6 wheeler—1500 Gallons.
International—Completely equipped —1200 Gallons.
International A7F—10 to 15 ton—6 wheeler.
Diamond T Model 1600—10-12 tons 6 wheeler.
Diamond T Model 1203—10 ton—6 wheeler.
Diamond T—6 wheeler—2600 Gallons.
Fruehauf Trailer — 3000 Gallon tank.

National Truck Sales, Inc.
3315 Archer Avenue, Chicago, Ill.

FOR SALE: At Wynona, Oklahoma—1 Twin and 2 Single Cooper gas engine type "S" compressor units with double acting cylinders. I.T.I.O. Company, Bartlesville, Oklahoma.

FOR SALE: At Bartlesville 1—2A National Portable Drilling Machine Less Tools. I. T. I. O. Co., Bartlesville, Okla.

FOR SALE: At Oklahoma City—9—80 HP 180 RPM 2 cycle type "10" Bessemer Engine-Compressor units with tandem cylinders. I.T.I.O. Company, Bartlesville, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE: At Oklahoma City — 1 Brauer shale separator, steam operated. I. T. I. O. Company, Bartlesville, Oklahoma.

TRACTORS

Caterpillars, crawler type, size "35" $375; size "65" with nigger head winch $750; Caterpillar RD8 with Letroneau bulldozer, $2000; and Allis-Chalmers, Model L with Baker bulldozer $1850. Perfect condition. O. C. Evans, Mount Sterling, Kentucky.

FOR SALE: At Oklahoma City 3"—4"—6"—7"—8"—10"—16", 20" victaulic—couplings less rubbers—cheap—I.T.I.O., Bartlesville, Okla.

FOR SALE: 6—40 gallon foam—outdoor type mounted fire extinguishers. Also 34—5 gallon foam type. I.T.I.O., Bartlesville, Okla.

FOR SALE: Now erected in Oklahoma City field, 50—1500 barrel 2 ring flat seam 12 gauge used oil storage tanks, $175.00 each. I. T. I. O., Bartlesville, Okla.

FOR SALE: Erected in Oklahoma City field, 15—500 Bbl. used BS&B VP bolted tanks, $75.00 each. I. T. I. O. Co., Bartlesville, Okla.

Survey Service

REMEMBER EAST TEXAS

"When all other methods fail, employ my divining or dowsing method. If oil exists this method finds it. Faults, broken treacherous areas accurately defined. Our Watson #2 first producer Wilmington, Calif., field, located by this method. Not theoretical prognostications. Approximate depths and thickness of sands given. 1 own production. Information to prospective operators, only. George Miller, 1548 Post, Torrance, California."

Geologic Survey

GEOLOGISTS—SURVEYORS
Looking for U. S. or State Geologic Surveys, or other government publications? Write Cornwall's Book Store, 723 Eleventh Street, Northwest, Washington, D. C. Unusually large stock.

Equipment Wanted

WANTED: Drilling bits, 24" or larger. 6" joints preferred. Also large Spudding or Cable-tool Drilling Machine. Machine with power unit attached preferred. Must be in first class condition. S. B. Geiger & Co., 37 W. Van Buren St., Chicago, Ill.

CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

Complete crude-price schedules are now being published in the first issue of each month. The last complete schedule was published in the January 2 issue. All changes in crude-oil-price schedules will be published completely in the first issues following the announcement of the changes. Following are representative crude-price schedules in barrels (42 gal.):

East Texas	**$1.10**
Conroe	**1.27**
Tepetate, Louisiana	**1.03**
Smackover, Arkansas, heavy	**.73**
Illinois basin	**1.15**
Pecos County, Texas	**.78**
Lance Creek, Wyoming	**.77**
Bradford, Pennsylvania	2.15

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

	Signal Hill, California*	Oklahoma, Kansas	Gulf Coast, Texas
14-14.9	$0.65	....	....
15-15.9	.65	....	....
16-16.9	.65	....	....
17-17.9	.65	....	....
18-18.9	.65	....	....
19-19.9	.69	....	$0.86
20-20.9	.73	$0.70	.88
21-21.9	.78	.72	.90
22-22.9	.82	.74	.92
23-23.9	.86	.76	.94
24-24.9	.90	.78	.96
25-25.9	.95	.80	.98
26-26.9	.99	.82	1.00
27-27.9	1.03	.84	1.02
28-28.9	1.07	.86	1.04
29-29.9	1.10	.88	1.06
30-30.9	1.14	.90	1.08
31-31.9	....	.92	1.10
32-32.9	....	.94	1.12
33-33.9	....	.96	1.14
34-34.9	....	.98	1.16
35-35.9	....	1.00	1.18
36-36.9	....	1.02	1.20
37-37.9	....	1.04	1.22
38-38.9	....	1.06	1.24
39-39.9	....	1.08	1.26
40-40.9	....	1.10	1.28

*Effective Feb. 1, 1940.

Crude-Oil Price Changes

South Penn Oil Co., Tide Water Associated Oil Co. and Pennzoil Co. increased the price of Pennsylvania Grade crude January 27 by 15 cents per barrel. Other purchasers were reported planning to meet the advance. The Monday increase, third since November 12, 1940, advances Bradford-Allegany crude to $2.30. Pure Oil Co. met the increase of 15 cents for crude it purchases in Cabin Creek and Kelly Creek fields of West Virginia where the posted price is now $1.89.

Amsco Pipe Line Co. and Barnsdall Oil Co. have restored the higher posted prices readopted a week ago by Republic Oil Refining Co. applicable to several fields in Southwest Texas. Amsco applied its restored price to the Plymouth, Taft, and East White Point fields while Barnsdall restored the price in Heyser.

Standard Oil Co. (Indiana), Phillips Petroleum Co., Carter Oil Co., Gulf Oil Corp. and Magnolia Petroleum Co. have adopted crude-purchase policies for Oklahoma and Kansas based on 100 per cent of tank tables, effective February 1, providing for full deduction of contamination and for correction of volume to 60° F.

Pure Oil Co. posted flat prices January 22 for Creole and Sweet Lake crudes of Cameron Parish and Gueydan crude in Vermilion Parish, Louisiana. The new flat prices are:

Creole	$1.01
Gueydan light	1.03
Gueydan heavy	.89
Sweet Lake	.91

The company formerly posted a gravity table ranging from 86 cents for 20° gravity crude to $1.28 for 40° and above.

Eastern States

SOUTH PENN OIL CO.
(Effective January 27, 1941)

Pennsylvania Grade oil in National Transit lines (Bradford field)	$2.30
Pennsylvania Grade oil in Southwest Pennsylvania lines	1.95
Pennsylvania Grade oil in Eureka Pipe Line lines	1.89
Corning grade oil in Buckeye Pipe Line Co. line	1.12

TIDE WATER ASSOCIATED OIL CO. and NEW YORK TRANSIT CO.
(Effective January 27, 1941)

Bradford, Pa.	$2.30
Allegany, N. Y.	2.30

PENNZOIL CO.
(Effective January 27, 1941)

Group A	$2.23
Group B	2.22
Group C	2.21
Group D	2.20
Group E	2.18

QUAKER STATE OIL REFINING CORP.
(Effective January 27, 1941)

Southern Ohio (Pa. Grade):	
In Buckeye Pipe Line lines	$1.85
In Eureka Pipe Line lines	1.89

PURE OIL CO.
(Effective January 27, 1941)

West Virginia	$1.89

Gulf Coast Markets

(Continued from Page 233)

for any possible price strengthening. Buyers expressed confidence in their ability to get all the material they desired at 3 cents should they have occasion to buy. Several small-lot purchases were made at that figure. Present low quoted prices remain 3⅛ cents.

Residual fuel of Bunker C grade still is offered freely at 75 cents for cargo lots, but in view of prospective demand due to expected new industrial demands, the outlook is more bullish than for the distillates.

Some firming of kerosenes was reported from some sources, but from others material was offered at previous low figures.

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